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THE

LONDON JOURNAL

OF

Arts and Sciences;

CONTAINING

REPORTS OF ALL NEW PATENTS,

WITH

DESCRIPTIONS OF THEIR RESPECTIVE PRINCIPLES AND PROPERTIES;

ALSO

Original Communications

ON OBJECTS CONNECTED WITH

SCIENCE AND PHILOSOPHY;

PARTICULARLY SUCH AS EMBRACE THE MOST RECENT

INVENTIONS AND DISCOVERIES

IN

PRACTICAL MECHANICS.

BY W. NEWTON.

VOL. IX.

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AND W. NEWTON, CHANCERY LANE.

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TO THE PUBLIC.

In closing the Ninth Volume of the "LONDON JOURNAL OF ARTS AND SCIENCES," the Proprietors beg leave to state, that they have been induced, at the repeated request of many subscribers, to add, upon this occasion, a *Supplementary Number*. They hope, that in thus increasing the price of the present volume to seventeen shillings and sixpence, they shall not be considered by the public as trespassing upon that indulgent patronage, which they have so long experienced, and are so anxious to merit, but, as having adopted this as the only means of satisfying the many enquiries respecting Patents not yet reported in this Journal. They beg further to say, that the utmost exertions are made to give an early publicity to every new invention, but the very great increase in the number of Patents granted within the last year, has necessarily placed some of them in arrear. The Public may, however, rest assured, that the Proprietors of the "LONDON JOURNAL OF ARTS" will strictly fulfil their first pledge, and give a copious description of EVERY NEW PATENT INVENTION, as early as the plan and limits of this periodical will allow.

LIST OF PLATES IN VOL. IX.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. XLIX.

Recent Patents.

To William Bundy, *of Fulham, in the County of Middlesex, Mathematical Instrument Maker, for his Invention of an Anti-evaporating Cooler, to facilitate and regulate the refrigerating of Worts or Wash, in all Seasons of the Year, from any degree of Heat, between boiling and the temperature required for fermenting.*

[Sealed, 1st November, 1823.]

The apparatus which forms the subject of this patent for cooling worts, of which a notice was given in our sixth volume, page 324, consists of a series of pipes or tubes issuing from a main trunk, through which the hot liquor flows. These pipes are enclosed in a tub or vat, and surrounded with cold water, for the purpose of abstracting the heat of the wort as it passes along, and by these means the liquor cools down to the point of temperature desired.

The construction of the apparatus admits of consider-

able variation as to form and dimensions, the principles remaining the same; but to render it perfectly evident, a convenient arrangement is shewn in Plate I. fig. 1. The figure represents two vats (there may be several in connection if required) filled with water, each containing a series of refrigerating pipes, issuing from a main trunk at top, and concentrating into another main trunk at bottom. The first vat A, is supposed to contain a similar series of pipes to those shewn in the section of the second vat B. The wort runs from the boiler through the cock *a*, into what may be called the hop back *b*, and from thence, after being strained, flows through the cock *c*, into the distributing box *d*, (which is shewn detached at fig. 2.) From this box a series of pipes, (perhaps sixteen) are made to branch off, and are coiled round in concentric circles, in the way seen at B, in the first figure; where they are made to lay as nearly as possible upon the same inclination, and are all brought ultimately into one trunk at the bottom.

The pipes in this vat, eleven in number, are coiled in five circles, and are bent round and brought into the inclined position, one above the other, as convenience may dictate. Each pipe is supported by small blocks on the sides of the wooden standards, and the whole are placed as nearly as possible on the same angle of descent. The arrangement of the pipes as described in the vat A, will be clearly seen in the section of the vat B, as they are precisely alike in each, and would be so in the remainder, if there were several other vats connected. The second series of pipes; that is, those in the vat B, conduct the liquor to the third vat, if a third be employed, or into the working squares or other vessels.

Suppose the wort when run into the hop back to be nearly at a boiling heat, it flows thence through the cock *c*,

into the box *d*, and to the distributing pipes within the vat. This vat as before said, is filled with water, which as the wort flows through the several branches of the pipes, takes up the heat, and consequently cools the liquor considerably. At the bottom of the coil, all the pipes meet again in one trunk, and the wort, if sufficiently cooled down, may be drawn off by the cock *e*, at the bottom of the vat A; but if its temperature should not be sufficiently lowered, the cock *e* must be closed, and the wort allowed to pass up the pipe *f*, and through the distributing box *g*, to the second series of pipes in B, and ultimately into the trunk *h*, where all the pipes concentrate. The wort by this time is supposed to be sufficiently cooled for fermentation, and is therefore allowed to flow through the cock *i* into the working squares, the refrigerating process being completed.

The cold water employed must be first introduced into the vat B, through the central trunk *k*, to the bottom of the vessel, where becoming heated, it will rise and flow over through a shute *l*, into the vat A, and there act upon the pipes through which the hottest wort is passing, and be ultimately discharged at top; by which means considerable saving of water is effected, as the cold water in entering the second vat will complete the refrigerating process, which has been begun in the first vat, by the water discharged from the second.

The patentee does not confine himself to any particular number of vats to be employed, nor to the precise arrangement of the pipes, shewn in the figure, as the principle of refrigerating worts, by passing them through branching or diverging pipes, surrounded with cold water, is claimed by him in all its variations of detail.

[*Inrolled, May,* 1824.]

To John Burn, *of Manchester, in the County Palatine of Lancaster, dealer in Cotton Twist and Weft, General Commission Agent for manufactured Goods, for his Invention of a new Apparatus for Dressing various kinds of Cotton, Flaxen, Woollen, or Silk Manufactures.*

[Sealed, 14th April, 1824.]

The purpose of this new invented apparatus is to singe the surfaces of cloths or other fabrics made of cotton, flax, wool, or silk, in order to remove the superfluous fibres of the thread, which give a downy appearance to the fabric before it has been dressed by singeing. Red-hot cylinders have been generally employed for this purpose, over which the articles have been passed rapidly, and by that means the fibres burnt off without injury to the threads. The flame of oil-lamps, spirit-lamps, and gas-burners, have also been employed, but these flames have generally been permitted to pass through the interstices of the woven material, and thereby to burn the internal fibres as well as those on the surface, and which has tended considerably to weaken and injure the substance of the fabric.

The present patentee intends to employ a burner, or lamp of gas, oil, or spirit, as he may find most desirable; but it is for the construction of his machinery that the patent is obtained, and not for the material used to produce the flame, by which machinery he purposes to singe both the surfaces of the fabric operated upon, without permitting the flame to pass through its interstices.

Plate I. fig. 3, represents an elevation of the end of the apparatus; both ends being alike, the width is to be

regulated by the breadth of the goods requiring to be dressed; this machine is adapted to a gas-flame, but any other fire, or an ordinary heated cylinder would answer the same purpose, the gas apparatus not being claimed as part of the invention; *a a a*, is the frame-work of the machine, made of cast iron, the arrows representing the direction of the cloth, when the handle *b* is turned; for the arrangements of cog-wheels are the same on both sides of the machine, so that the cloth having been wound to one side by the handle *b*, is returned to the other by the handle *c*, undergoing a double operation of traversing; *d e f* are three large hollow cylinders of rolled iron, tinned, all of which revolve on their axis; the bearings of *e* being stationary, and of *d* and *f* moveable, for the purpose of being adjusted by means of screws, which enables them to be moved nearer to or farther from *e*, as the substance of the goods to be dressed, or the dimensions of the fire apparatus may require; *g*, is termed a safety-roller, and is formed of wood resting upon, and revolving with the centre cylinder *e*; it is used as an extinguisher to put out the sparks left by the burning on the surface of the goods.

The roller marked *h* is the drawing off roller, having above it another safety roller to extinguish the sparks; the roller marked *i*, with the one above it, on the other side of the machine, is for the same purposes. There are also two other cylinders, *j* and *k*, in the lower part of the machine, under which the fabric passes, as shewn by the lines and arrows; and at *l l l* are three jets of flame, the upper ones acting against the face of the fabric, and the lower one against its back surface, for the purpose of singeing it.

These rollers are all intended to prevent the penetration of the fire beyond the surface of the goods,

and by their arrangement the surface to be dressed is presented to the action of the fire in a perpendicular position, so that both sides of the goods are singed at the same time. The rollers *m m*, fitted with adjustment screws, serve the double purpose of guide and safety-rollers; and there are scrapers *n n n*, which advance or recede by means of adjusting screws; *o o* are plates of rolled iron, tinned, which are suspended between the doubles of the cloth by adjusting rods, screws and nuts; these require occasionally to be cleared from the burnt particles which collect on them, the edges of which scrape up the nap of the goods, prepare them for singeing, and remove the burnt particles when done.

Having explained the various parts of this machinery, the patentee proceeds to show its operation, which is as follows:—The fabric to be acted upon is first coiled upon a roller situate near the point *p*, from whence it is conducted between the rollers *i*, which in this case act as tightening rollers; from thence it passes over *d*, under *j*, in the lower part of the machine, then up over *e*, down again under *k*, and up over *f* to the drawing-off rollers *h*, between which it is conducted to the taking-up roller situate near the point *q*.

In this progress of the fabric it is subjected to the action of the flame at the jets *l l l*, both on the front and back surfaces; and if once passing it through the machine is not found to be sufficient, the handle *c* will conduct it back again, and subject it to a second singeing, in an upright position, which may be continued until the operator shall think the effect complete.

In passing over the cylinder *e*, the cloth also passes under the safety roller *g*, which puts out the sparks almost as soon as created; and the scrapers *n*, not only

scrape up the nap but also take off the particles burnt previously.

It is unnecessary to describe particularly the process of singeing the backside of the fabric, as it is performed in the like manner, but not with such great perfection, as that is not always required.

[*Inrolled*, 11*th October*, 1824.]

To George Hawkes, *of Lucas Place, Commercial Road, in the Parish of Stepney Old Town, in the County of Middlesex, Ship Builder, for his Invention of certain Improvements on Capstans.*

[Sealed, 1st November, 1823.]

The specification of this patent commences by stating, that the "capstans at present in use are made in one united mass, and have only one power, and are moved by capstan bars." The contrivances which constitute the subject of the present improvement, consist in a method of constructing capstans of several pieces, capable of being combined or disunited, so as to allow of their easy removal; and also of so forming them, that the upper portion of the barrel may be smaller in circumference than the lower, having a projecting part between, which separate the barrels into two; likewise a method of actuating the capstans by means of wheels and pinions in bevel or right angle gear, which are made capable of shifting, to give different powers and velocities.

The capstan is formed of sectors, or pieces secured together by clamps, screws, or bolts; and the actuating shaft is placed in a horizontal position, and turned by a train of toothed-wheels. Plate II. Fig. 1, is a vertical section

of a single capstan, formed by several sectors of wood or iron; and Fig. 2, is a plan or horizontal section of the same, taken at the lower part, for the purpose of shewing the paul head. A small capstan may be composed of three or five pieces combined—a larger one, with six or more, as circumstances may render eligible. These, when united, constitute a capstan of great superiority in point of strength, compared to those in common use. The several sectors, or separate pieces, *a a*, form the whelps, the paul head, and the drumhead. On the drumhead are two circles of teeth of different radii *b b b b*, into which one of the pinions *c c*, of the horizontal shaft *d*, are intended to work.

Fig. 3, is a double capstan, having an upper and lower spindle, intended to be combined by means of a bolt passing through the two, by which means both capstans may be worked by one rotatory motion. In this case, it will be necessary to introduce keys *e e* into the notches or grooves *f*, at the hinder parts of the whelps, for the purpose of bolting or wedging the spindles to the capstans, and to remove the cheeks *g*, which confine the lower spindle.

In Fig. 3, *h* is a crank to be turned by manual labour, which is affixed to the rotatory shaft, *i*. This shaft, however, may be turned by a steam engine, or any other first mover. To the shaft *i*, a toothed-wheel, *k*, is attached, which actuates the train of wheels connected to it, for the purpose of turning the capstan. Thus, the upper wheel *l* is driven round, and with it the horizontal shaft *d*, upon which are the pinions *c* that take into the teeth *b*, on the top of the capstan.

According to the power required, one of the pinions *c* is to be put into gear with one of the rims of teeth *b* on the drumhead; and by the rotation of the shaft *i* the capstan is turned. It may however, be found more desirable to

actuate the capstan by means of the pinion *m*, upon the shaft *n*, at the lower part of the train; which shaft turns by the same means as above described; and this pinion, taking into a rim of teeth, *o o*, on the paul-head, drives the capstan round. There are rollers *p p* introduced under the capstan, for the purpose of reducing the friction; and in some cases, balls or shot may be placed in the recesses behind the whelps, for the same object. There is also a security collar *q*, resting upon the deck, in which the spindle turns, and which gives stability to the capstan.

Round the lower part of the capstan there is a series of pauls seen at *r r*, in the 2d fig., which are hung upon pins round the paul-head, and are contrived to rest one on the back of the other, for the purpose of assisting to press each other into the ratchet or catches, which are from two to three inches apart.

Fig. 4, is an apparatus to be employed in bringing the cable to the capstan, for the protection of the machinery; but it is to be regretted, that the description and drawings of the whole apparatus is not so clear and intelligible as might be wished.

The patentee considers the invention capable of being adapted to the working of the ship's pumps, at the same time as the capstan; and he also proposes to lay a shaft from the side of the vessel, to be actuated by the rotation of the capstan, for the purpose of propelling the ship in a calm; and the drumhead of the capstan is to be provided with the usual holes, for the purpose of enabling the capstan to be turned by bars, as usual.

[*Inrolled, May,* 1824.]

Note.—See Philips's Improved Capstan, Vol. ii. and Nichols's Improved Capstan, Vol. iii. of this Journal.

To George Hawkes, *of Lucas Place, Commercial-Road, in the Parish of Stepney Old Town, in the County of Middlesex, Ship-builder, for his Invention of an Improvement in the Construction of Ship's Anchors.*

[Sealed, 1st November, 1823.]

These improvements consist in forming anchors in two parts: viz. one-half of the shank and the whole of the fluke in the length of the anchor, and afterwards giving the form required by bending. In case the bars are not of sufficient length for manufacturing, they are to be welded, and the welds divided between the number of bars required to form the size wanted.

By constructing the parts of anchors in this manner, the patentee considers they will not be liable to bad welding, or being burnt by the high state of fusion required to form a weld, and that they will also in bending experience a severe trial as to their strength. This method of manufacturing will allow of a groove to be formed in each side of the shank for a chain or bolt to pass through, and an eye or aperture in the shank to admit the wood stock, which may be made round or otherwise, in two pieces, one to pass each way, having shoulders of iron in the middle, and when hooped together, will be totally prevented from coming out.

The form and manner of constructing this anchor will be seen in Plate II. fig. 5 and 6. The principle on which the anchor is formed in two parts is seen at Fig. 5; a groove *a* is made down the middle, sufficient for the cable to lie in, which may be either of chain or hemp; *b* is the eye or aperture, to hold the stock; *c* exhibits a portion of chain laid in the groove; *d* the ring or shackle at the crown for the buoy-rope, and by this ring

the chain is made fast; a stout iron rod may be adapted to answer the purpose of the chain *c*.

Fig. 6, shews the anchor when ready for use, the chain passing through the shank and stock; *e e e* are bracing hoops for holding it together; *f* a collar to fit the square; *g g* the palms; *h* a plate on the crown. It is also proposed, for making the anchor more firm, to introduce crow bars between the rings and shaft.

By this method of constructing anchors, parts may be made either to suit two, three, or four fluked anchors, and put firmly together by the above means; it will also admit of one or two pieces being attached together, to act either as a single or common anchor, in case of necessity at sea.

It will easily be seen, by the above description, that the novelty on which the patentee rests his claim, consists in making the shank and fluke out of one bar of iron, and forming the anchor in two separate parts, which he states for strength will be far superior to the present manner of manufacturing, and totally prevent the liability to defects in bad welding.

[*Inrolled, May,* 1824.]

To Thomas Ryalls, *of Sheffield, in the County of York, Warehouseman, for his Invention of an Apparatus for Shaving, which he denominates the Useful and Elegant Facilitator.*

[Sealed, 8th April, 1824.]

The subject of this singularly ridiculous title, is an appendage to the handle of a razor, and a peculiar kind of strop; upon the back part of the handle is a metal

slide, by which the sides of the handle are pressed together, and the joint of the razor tightened, and which is also intended to prevent the handle from warping. The strop is said to be more efficacious in sharpening the razor than any other strop heretofore used, and is "warranted never to get the worse for wear," but even to improve by time and use; it is made of a strip of buff leather, rubbed over with an unctuous matter made of oil and virgin wax, after which it is to be hammered upon an anvil, for the purpose of closing the pores and rendering the surface smooth. The strop is then to be glued upon a slip of wood with a piece of woollen cloth at the back, for the purpose of cleaning the razor before stropping. The strop is to have a horn slider turning upon a pivot, for the purpose of covering its face and keeping it clean, instead of the sheath commonly used.

[*Inrolled, June,* 1824.]

To HENRY BERRY, *of Abchurch Lane, in the City of London, Merchant, for certain Improvements on a Machine or Apparatus for more readily producing Light.*

[Sealed 20th March, 1824.]

THE Apparatus which forms the subject of this patent, may be called an instantaneous light machine; its parts cannot perhaps be considered perfectly new in themselves but the combination founded upon known principles appears to have considerable novelty, and forms certainly a very tasteful, compact, and convenient philosophical instrument, capable of producing ignition by the mere contact of certain chemical substances? The

apparatus is inclosed in a small metal box, which is sufficiently portable to be carried in the pocket: this box is intended to be placed open upon the table in the bed chamber, and for the convenience of invalids, a small silken cord is attached to it, which may be carried across the room, when the sick person sitting in a chair, or lying in bed, by slightly pulling the string, will immediately set light to the lamp which forms part of the apparatus.

Plate I. Fig. 4, shews a plan or horizontal representation of the box which contains the whole of the apparatus; it is divided longitudinally, one half being occupied by the lamp, and the other by the apparatus, which is secured and inclosed by a lid that shuts up all securely. Fig. 5, is a vertical section taken lengthways, and cut through the parts, by which their internal construction will be seen. Fig. 6, is a vertical view at the end, the side of the box being removed for the purpose of shewing the forms and positions of the several parts of the apparatus within; similar letters referring to the same parts in each of these three figures.

a is a glass bottle half filled with pure sulphuric acid, which bottle is encased with metal, and is attached to the box by slipping into a groove; *b* is a long conical stopper made of glass, which is supported by two brass rods *c*, that slide up and down in tubes *d d*, having stops at bottom, and secured by screwed caps at top; *e* is a collar of caoutchouc, which closes upon the neck of the glass bottle, and being pressed upon when the lid of the box is shut down, by its elasticity closes the bottle so perfectly as to prevent the escape of the acid: *f* is a revolving carriage or reel, which holds the prepared matches. The shaft of this reel turns in the cylindrical tube *g*, and has a helical spring coiled round it. This

spring is fixed to the seat of the shaft within the tube at one extremity, and to the shaft itself at the other, which causes the spring when put in action to turn the shaft and the match carriage round; *h*, is a standard with a cross at the top, bearing a pulley *i*, over which the cord *k*. passes, and is at its extremity hooked to the ring of the stoppers. This cord is conducted through a circular eye or guide on the top of the standard, and when drawn in any direction, however oblique, raises the stopper.

The prepared match having been placed in the reel so as to press against the wire guard, when the stopper ascends is permitted to come in contact with the long conical end of the glass stopper, and there receiving a small portion of the acid from the bottle which acts upon the tip of the match, (prepared with the well known composition of oxymuriate of potash,) the match instantly takes fire, and by the power of the helical spring is carried round to the burner of the lamp, which is by the burning match immediately lighted.

When oil is used in the lamp, a hollow ground stopper as an extinguisher is adapted, but when alcohol is employed instead of oil, an extinguisher with a long hinge, as shewn in the figure, is to be preferred. This extinguisher has a collar of caoutchouc for the purpose of preventing the escape or evaporation of the spirit. The several parts of the apparatus are attached to the box when in use, by sliding in grooves, and are readily displaced and packed within when required to be carried about.

The patentee does not claim the whole as an original invention, but as a new combination of known principles with certain additions, such as the revolving match carriage, the pulley, and its eye or guide, with the cord passing over it, and also the elastic valves or collars formed

of caoutchouc as attached both to the stopper of the bottle and to the extinguisher; and he further considers, that such elastic valves or stopper-collars are also applicable, and will be found extremely desirable for a variety of other bottles; indeed, in all cases where air-tight stoppers are required, and particularly for all bottles containing chemical fluids.

[*Inrolled, September*, 1824.]

To Joseph Spencer, *of Belper, in the County of Derby, Nail Manufacturer, for his Invention of certain Improvements in the Construction of Furnaces and Forges, for the preparation of Iron or Steel, and for the process of Manufacturing Nails, and other Articles, from the said Materials.*

[Sealed, 7th April, 1824.]

The improvements of which this patent is the subject, consist in the erection of a furnace or forge, of a peculiar construction, for preparing iron or steel, to be used in the manufacture of nails, or other articles. It is to be of a circular form, of brickwork, about four feet in diameter, and three in height, with a circular aperture in the centre for the fire, and an opening near the ground, communicating with the outside, for removing the dust and dirt that may fall through the grate.

When the brick-work has been carried up twenty or twenty-four inches, the circular aperture in the inside is to be covered with a fine grating of cast iron, the bars being a quarter of an inch apart, and the grating made sufficiently large to form the bottom of the fire place; the erection is then to be raised three courses, with fire-

brick, leaving an aperture for the bellows-pipe. The whole is to be covered with a flat circular cast iron plate in one, two or more pieces, having a rim round the external edge, to the depth of six-inches, to hold fuel for the occasional supply of the fire.

In the centre of this plate there is an opening large enough to admit a frame, to be placed on the fire-brick, which consists of a ring of cast iron flat upon the bottom, and one inch and a half in thickness on the outside edge, levelled to half an inch on the inner, the ring being twenty inches in diameter, and the interior opening fourteen. On this ring three pillars are erected, nine inches in height, to support a similar ring of the same material and dimensions about half an inch thick, with a small rim or selvage on the outer edge, for the brick-work of the chimney to rest upon, the flue is then to be carried from this upper plate or ring to the required height, and in the brick-work may be inserted three troughs for holding water.

The bellows may be suspended upon a frame [in any situation most eligible to be worked by a double lever united with a bow so as to be within the reach of the workmen employed around the furnace. In the making of nails, six workmen may be advantageously employed at one time, so as to keep up a continual blast from the bellows, that the fire may be always bright and vivid.

In the preparation of iron or steel, for the purpose of manufacturing nails and other articles, it is proposed to use a certain portion of coal purified from sulphur, or other noxious matter, by calcination, and a certain portion of wood charcoal. The quantity are, three fourths of purified coal to one fourth of charcoal, but these proportions admit of variations according to the nature of the coal and the metal to be wrought.

The patentee does not confine himself to the above stated dimension or form in constructing his furnaces, as he says, "any other form or size may be used suited to the articles to be manufactured, also stone may be used in the elevation, or it may be made altogether of iron, &c." We do not however perceive in what particular feature of novelty the invention consists.

[*Inrolled, October,* 1824.]

To JOHN GUNBY, *of New Kent Road, in the County of Surry, Sword and Gun Manufacturer, for his Invention of an Improvement in the Process of Manufacturing Cases for Knives, Scissors, and other Articles.*

[Sealed, 14th April, 1824.]

THE real object of this patentee is to make scabbards for swords and cartridge boxes of paper, thin skins of leather, or cloth, covered with varnish, instead of thick leather, as heretofore, for the purpose of rendering them extremely light, and, as he says, more durable. Scabbards and cartridge boxes made in the ordinary way of leather, prepared by the common mode of currying, and joined at the edges with waxed thread, are very subject to decay, both from wet, and from warm climates, but those made upon this improved plan are impervious to wet, and are not affected by heat, consequently no damp can remain either on the inner or outer surface to the detriment of the sword blade or other weapons, or to the injury of the gunpowder.

To make cases or scabbards for sword blades, bayonets, or dirks, thin leather of sheeps skin, paper, or cloth,

is to be cut to the proper size, and joined at the edges with glue or strong paste, and when the case so formed is perfectly dry, one or more thicknesses of paper, cloth, or leather is to be laid over the first, according to the thickness required. When the whole is dry and presenting the appearance of a firm compact body, the joints and other elevated parts are to be rubbed down, and the surface rendered smooth. Then oil colour, or varnish colour is to be used to coat the scabbard, both on the outer and inner surface, and this is to be repeated several times, drying each coat of oil or varnish, either in the air, a hot room, or in a japanner's stove, and the scabbard so prepared will be found perfectly impervious both to damp and heat.

For cartridge boxes or magazines, the internal part is to be formed of wood as usual, and then covered with paper, skin, or cloth, as the scabbard above described, and when perfectly dry it is to be also coated with varnish or oil, both within and without, and dried in a stove, a hot room, or in the air, which will render the box perfectly impervious to the action of the atmosphere.

The flaps or lids of such cases are to be made of millboard, and having been cut to the desired form, they are to be saturated with a solution of glue, and drying oil, such solution being composed of three or four parts of thick melted glue, and one part of oil, which will readily mix at a moderate heat by agitation. When this lid is nearly dry, it is to be brought into form by means of a press made of wood or iron, as shewn in plate II. fig. 7; *a* is the mould, and *b* is the press which is to be forced into the mould by means of a weight, the flap about to be formed being between the two, as at *c c*. In this it remains until dry and is then coated with layers of cloth or skin as the scabbards, and then with the oil

colour, or varnish colour. The joints by which the flap is fastened to the box are made by rivets, or screws, by which the flap will be enabled to fall readily into its place. A cartridge case so made will be much lighter than any heretofore made, and being defended by the varnish or oil, is much better calculated to resist the action of the weather, and the atmosphere of different climates.

[*Inrolled, October,* 1824.]

To Joseph Aspdin, *of Leeds, in the County of York, Bricklayer, for his New Invented Improvement in the Mode of Producing an Artificial Stone.*

[Sealed, 21st October, 1824.]

This cement or artificial stone is proposed for the covering of buildings as stucco, and is suited either for dry situations or for water-works. The patentee designates the material Portland Cement from its resemblance to Portland stone; its component parts are as follow: a given quantity of lime-stone of the kind usually employed for mending roads is to be pulverized by beating or grinding, or it may be taken from the road in a pulverized state, or in the state of puddle. This when dried is to be calcined in a furnace in the usual way. A similar quantity of argillaceous earth or clay is then to be mixed in water with the calcined lime-stone, and the whole perfectly incorporated by manual labour, or by machinery, into a plastic state. This mixture is then to be placed in shallow vessels for the purpose of evaporation, and is to be submitted to the action of the air, the sun, or the heat of fire, or steam conducted by pipes, or flues under the pans or evaporating vessels.

This composition when in a dry state is to be broken into lumps of suitable sizes, and is then to be calcined again in a furnace similar to a lime kiln, till the carbonic acid has been entirely expelled. The mixture so prepared is then to be pulverized by grinding or heating, and when reduced to a fine powder, is in a fit state for use, and with the addition of so much water as will be sufficient to bring it into the consistency of mortar, will, when applied to its purpose, make a compact and durable artificial stone, equal to the Portland stone itself.

[*Inrolled, December,* 1824.]

To James Russell, *of Wednesbury, in the County of Stafford, Gas Tube Manufacturer, for his Invention of an Improvement in the Manufacture of Tubes for Gas and other Purposes.*

[Sealed, 19th January, 1824.]

These improvements appertain to the peculiar mode of forming pipes and tubes of malleable iron, as practised by the patentee. He states that he provides iron plates previously rolled to a suitable thickness, and cut into strips of such length as may be found desirable to constitute one piece of pipe or tube, the breadth of the strip corresponding to the circumference of the tube intended to be formed.

The sides of the slips are then bent up by swages, or otherwise in the usual way, so as to bring the two edges as close together as possible.

This bent iron, or imperfect tube, is then introduced into a blast furnace, and when brought nearly into a state

of fusion, is removed, and placed under a tilt hammer for the purpose of welding the joint. The anvil, or the bolster fixed into the anvil upon which the tube is to be placed, has a semi-cylindrical groove formed in it, and the under side of the hammer has a corresponding groove. The imperfect tube is now slowly passed along under the tilt hammer, and by a succession of blows, the edges of the plate-iron become welded from end to end, and the tube rudely formed. The action of the tilt hammer is effected as usual, it vibrates upon pivots, and by the rotation of a wheel with projecting arms or cogs, which strike successively upon the end of the hammer, it is raised, and falling by its own gravity produces the repetition of blows.

When the edges of the iron have been thus completely welded from end to end, the tube is to be again heated in a furnace as before, and then passed through a pair of grooved rollers. These rollers may have several circular grooves suited to tubes of different diameters. The end of the tube immediately as it comes out from between the rollers, is met by a conical or egg-shaped core, placed at the extremity of a stationary horizontal rod, which egg-shaped core enters the open end of the tube, as it advances from between the rollers, and by sliding upon this core the internal part or bore of the tube is formed to the exact diameter of the core, and rendered perfectly smooth, its external form being determined by the grooved rollers.

The advantages which are proposed by this mode of manufacturing tubes and pipes, of wrought iron, for conveying gas, and other purposes, are, that the internal and external surfaces of the tubes will be perfectly cylindrical and parallel to each other, and that the irregularities occasionally arising from scales and other obstructions will be altogether avoided. The claim of invention

therefore, is not to be considered as resting in the implements used in the operation, which are not new in themselves, either in formor character, but in the mode of operating, which as respects the formation of pipes and tubes of malleable iron, is new.

[*Inrolled, July,* 1824.]

Original Communications.

To the Editor of the London Journal of Arts.

SIR,

THAT something should be done to improve the streets of the metropolis, I mean that part forming the carriage-way, is so generally admitted as to render any comment from me altogether unnecessary.

Allow me, through the medium of your very valuable miscellany, to propose the following, which, I presume, would be at least one step toward that very desirable object. To elucidate my proposition, I have herewith sent two drawings, they are made to a scale of one twenty-fourth the size, (or what I conceive would not be an inconvenient weight.) Plate II. Fig. 8, is a plan or horizontal view, shewing several of the boxes or containers conjoined, and one of which is seen filled with stones in the manner intended to form the roadway. Fig. 9, is a section of the same, shewing the brackets or angular pieces in the bottom for giving strength to the box, and also the lips or edges which hang over on the sides for the purpose of bearing upon the adjoining containers, thereby preventing the roadway from sinking partially. The boxes or containers are intended to be

of cast iron. The stones are to be placed in the boxes so as to form a regular surface, and to fix them securely in their proper places, the interstices are to be filled with roman cement, or any other material possessing similar properties. Pavement formed on this principle of mutual support would require little more to be done to the ground on which it is intended to be laid, than to give it the form the surface is intended to assume when finished; from the manner in which the containers rest and are rested upon, it is almost impossible that a partial settlement can take place; it will of course be understood that the containers must be made to suit the form of the street both in plan and section, and that a box on each side should be made, to form the gutter. Boxes for fire plugs, drains, &c. will of course be wanted. This kind of pavement might be prepared at any distance, and laid down in much less time than is required in laying stones in the usual way. When the containers are deposited in their proper places, the joints between them should be filled with the same kind of cement that is used in fastening the stones.

The whole being thus formed into a solid inflexible mass, impervious to water, gravel, or mud, the principal sources of dust in dry, of dirt in wet weather, when the stones are worn down to the iron, which must be after the lapse of many years, the containers are to be taken up and refitted.

Before I close, you will perhaps permit me to make an observation or two upon the mode of supplying water from the mains in case of fire.

During the conflagration which occurred in Fleet-Street, a few weeks ago, I could not but regret the extraordinary loss of water, a stream of which, of considerable magni-

tude, was running to waste on each side of the street. It is not the cost of the water to which I wish particularly to direct attention, but to prevent the useless expenditure, and from the consequences which have resulted from the want of it at so perilous a time, it more decidedly behoves those under whose direction it is placed to be as economical as possible.

I am aware that it will be said, by what means is the subject of your complaint to be removed? the water must run in the street to supply the different extinguishing engines. That is just what I wish to prevent. As I am but very imperfectly acquainted with the subject, permit me to lay my crude idea before your readers, in the expectation that something better may be elicited.

I propose that every turncock should have in his charge a tube to fit on, or in, the pipe, by which the water makes its escape, for the supply of the engines in case of fire. That tube, that it should not be heavy, might be made of copper or gun metal, just long enough when in its place, to stand a little above the pavement, having a cylindrical enlargement at the upper end, in the circumference of which should be six (or whatever number was judged most expedient) orifices, and the short projections in which the same are formed should be prepared with screws similar to those used for the purpose of connecting the hose. The suction, as it is called, instead of having at the end a piece of perforated pipe, or strainer, should be furnished with a suitable screw, which when connected with any one of the screws on the tube that I have recommended, would convey the water directly from the main into the engine; thus preventing loss of water, and removing the principal cause of the derangement and rapid destruction of the pumps,

by providing pure water instead of that mixture of sand and other impurities which must be the case when the water is taken as at present from holes made in the street.

I am, Sir,
Yours, &c.
J. CERCOVE.

On Sir H. Davy's Safety Lamp.

To the Editor of the London Journal of Arts.

SIR,

I BEG leave to make a few observations in your valuable publication, on the safety lamp, which may lead to investigation, and, I hope, will be useful in preserving the lives of a valuable portion of the community. We frequently hear of accidents in mines where the safety lamp is used, which is attributed to the carelessness of the miners in opening the lamps, but which should be attributed to its more probable cause, that of a current of condensed gas issuing from some newly made fissure in the rock.

It is now proved beyond a doubt that the lamp is of no use in a current of hydrogen gas, and that it acts by its heat in rarefying the gas and propelling it to a distance from its flame. The theory of Sir Humphrey Davy that fine wire gauze has the property of cooling flame, is too mystical for the modern school, and not founded on facts. A bar of red hot iron can be immersed in an atmosphere of hydrogen or carburetted hydrogen gas without producing explosion, the approaching heat

rarefies the gas too rapidly to allow it to come in contact with the iron; and the safety lamp acts upon the same principle, by heating the wire gauze, and of course rarefying the atmosphere that surrounds it. This can be easily proved by immersing the lamp when cold, i. e. immediately after being lit, in a jar of the gas, an instantaneous explosion is the consequence, inside and outside the wire gauze; but after the lamp has continued to burn a sufficient length of time to heat the wire gauze which surrounds it, no explosion takes place on immersion, but a safe and continued combustion of the gas that issues from the aperture in the bottom of the lamp which continues cold from its massive formation. A current of gas also forced upon the lamp from a bladder and stop-cock produces combustion interior and exterior of the wire gauze. These facts overturn Sir Humphrey Davy's theory, and prove, that to make a perfect safety lamp, its flame should be enlarged to increase its heat, and its gauze painted black to radiate it: a shield of glass should surround its sides, at the distance of a few inches from the wire gauze, leaving its top and bottom uncovered as at present constructed. The miner, by this improvement, would have a greater degree of light and safety, and feel courage and confidence in penetrating the gloomy and inflammable atmosphere that threatens his existence. Feeling it my duty to throw these observations before the public,

I remain, Sir,

Yours respectfully,

R. DILLON.

On Tanning.

To the Editor of the London Journal of Arts.

SIR,

HISTORY and experience prove that men are frequently more indebted to accident than design, for many of the most useful discoveries and improvements; which are moreover often accomplished by the simplest means; —the compass for instance.

I have discovered the means of ascertaining the relative degrees of strength in oak bark liquors; I have also discovered that the simple and regular application of oak-bark liquors, &c. to hides, will effectually tan sole leather in three or four months (according to their thicknesses) provided you commence at three degrees, and gradually increase the strength of the liquor thrice a week, up to fifteen or twenty degrees, taking care not to apply strong liquors till the leather is nearly tanned.

There can be no theory prescribed as to the exact time when the hides may be forced with advantage;—practice only can master in this nice point; the simple instrument I use, is an hydrometer, which I have surnamed a BARKOMETER, without which, I should be more in the dark, than brewers without saccharometers or thermometers.

I have also found means, by the constant use of pumps, to extract all the virtue from oak-bark in ten days, which generally lies in common tan-yards two or three months. My hydrometer proves I throw no tannin away.

The execution of this process with daily care, produces additional weight in leather over the standard. Tanners generally require twelve months to tan hides, that may by my system be done in three months with perfect ease. Common tanners are satisfied if a hide of eighty pounds,

when raw, yield forty pounds when tanned. Whereas, my process will produce forty-eight pounds of leather from similar hides, which is actually one fifth more leather in a quarter of the usual time. Is this not a plain proof that hides lay rotting, rather than tanning, after four months, because weight is the criterion of the quality of leather, and the least weight is the fruit of the longest time.

Many tanners immerse crop hides in bark, for two or three months during which single stage, I tan the stoutest hides in the kingdom, without more than the usual quantity of bark, because it is generally acknowledged that four or five pounds of oak-bark (according to its quality) will tan one pound of leather.

A sincere desire to extinguish the dry rot in the royal and commercial navies, first inspired me to seek for remedies, because I was convinced, that it was occasioned by heaving the timber at the bark harvests, instead of the WINTER, which was the *ancient* practice when bark was only worth 2s. per cart load, whereas now it is worth 150s.

I therefore next sought for native substitutes for bark, and I found abundant supplies cheaper than oak-bark, which answered equally well *except in colour*, as the leather proved rather dark, but I disregard the colour, while consumers use the best BLACKING.

Oak faggots yield excellent tannin; I have worn boots several years, that were tanned solely with oak saw-dust, but this is not novel.

In spite of the scarcity and dearness of oak-bark, prejudices against the colour, *forsooth*, soon decried these native substitutes. The naval dry rot still continues its monstrous ravages against all barriers and experiments in their harbours, docks, &c., and my next attempt was

to seek foreign remedies against that national misfortune, to preserve *Britannia*. I found that the annual importation of bark, &c. from Holland, &c., was about 100,000 tons (not 10,000 tons, as reported in the last Repertory of Arts) and that the whole consumption, (on the acknowledged data, that five pounds will tan one pound of leather) is only 117,000 tons, and yielded, according to the excise duties, 23,408 tons of leather, or about £655,000 to the revenue, in 1821.

Nothing can prove more clearly that the country is exhausted of *naval oak*, and that we are now dependent on foreign powers for a *staple trade* and manufacture, as well as *oak timber*. Plain facts are stronger than volumes of arguments!! These facts are generally unknown or disregarded, and thereupon require serious deliberation. Altogether they stimulated me to persevere against innumerable difficulties, instead of abandoning the most irksome and cheerless pursuits in despair, I turned my attention towards *foreign tannin* at last, and my efforts have been crowned with success beyond my most sanguine expectations. I find that *terra japonica* possesses stronger tannin matter than any other article.

The late Sir Joseph Banks reported to the East India Company, in 1802, that it was ten times stronger than oak-bark, and the East India Company used their best endeavours to encourage experiments and importation, without practical effect or benefit; for notwithstanding this knowledge at that period, the average importation, according to a letter I have had the honour to receive from the Honourable East India Company, does not since then exceed ten tons annually for chemical and medical uses.

The legislature have, however, wisely encouraged its

importation, by allowing tanners to use it on payment of a duty of 3s. per cwt.; whereas the duty on terra Japonica for all other purposes, is ten pence per lb.

The legislature therefore sees and feels the existing scarcity of *oak timber*, having reduced the duty on it from £6 to £2 15s. per load, which ought to be abolished altogether, to relieve ship builders as much as possible, till the excellent plantations in the royal forests become available at the end of the next century, for men of war, which ought to have been planted early in the last, when the present crisis was prophesied.

Under these circumstances, any substitute is a desideratum of vital importance. What then will be said at this having been so long neglected; but it resembles the history of *steam, and gas*. The truth is, tanners seek nothing but oak-bark.

Since the era of 1802, circumstances are reversed: then the war was renewed against France, native oaks fell in abundance for our navy, and land-owners were as well pleased to sell the bark as tanners to purchase.

The length of the war created effects which all must be anxious to repair. War never was the best period to cultivate *Arts and Sciences*. England now reposes. Every sun produces some improvements, great or small, and why is the tanning trade to be exempt?

The information I have gained, appears *miraculous*, but it comes from the best authority.

I am led to believe that terra japonica is an article of general produce, in all parts of India, and that it is probable abundant supplies may be obtained, provided there is a steady demand.

Instead therefore of importing ten tons annually, why not import ten thousand tons, which would employ

twenty ships of 500 tons, and would be equal to 100,000 tons of bark from Holland.

Sir H. Davy has also analyzed terra japonica, and pronounces it (according to Ure's Chemical Dictionary) equal to 8½ times, by weight, of oak-bark.

The most surprising part of the business still remains to be published; *the present price* of terra japonica, including the duty, is £33 for one ton, equal to 8½ tons of oak-bark, at £10 per ton, or £85; which is considerably less than half the present value of bark.

Hence our royal and commercial navies may be saved from the fatal effects of dry rot. Tanners may be relieved, every man may, in time, expect boots and shoes at reasonable prices, while our East India trade will flourish, and thousands of poor Indians may be usefully employed.

I am, Sir,

Yours, &c.

JOHN BURRIDGE.

Nelson Square,
November, 1824.

Novel Inventions.

Steam Washing.

IN our sixth volume, page 116, will be found the specification of Mr. Junius Smith's Machine for *Washing, Cleansing, and Whitening Cotton, Linen, Silk, and Woollen Garments, or Piece Goods.* Though we were fully aware of the efficacy and superior advantages of this process over the ordinary mode of washing by

hand, yet we little expected the plan would ever be realised upon so extensive a scale, and with such complete success, as we have had the pleasure of witnessing in the Steam Washing Company's Works at Phipps Bridge, near Mitcham, Surrey.

For the drawings and explanation of the simple machinery here employed in washing clothes, we beg the reader to refer to our sixth volume, as above; but from the many mis-statements and illiberal remarks which ignorance and prejudice have foisted upon the world through the daily papers, relative to steam-washing, we feel it a duty which we owe to the public to devote a page of our journal to a description of the entire process, and to assure our readers that the best possible order is preserved in the dispensations of the establishment, considering its magnitude, and the most complete satisfaction of the customers in general has been the result; we state this both from observation and experience.

The carriages of the Company collect the foul clothes from house to house, in London and its vicinity, on certain days, and convey them to the works at Mitcham, where they are first ticketed with certain marks, and entered in a check-book. The various articles are then sorted according to qualities, such as fine muslins, lace, &c.; shirts and small linen; the larger kinds of linen and cotton articles, such as table-cloths; and lastly, sheets and bed-furniture. Besides these, small woollen and silk articles are under a distinct head, and so also are great-coats, blankets and carpets, which classes are all operated upon distinct from each other.

Some of these articles are then soaked in an alkaline solution (soap and water) if necessary, previous to steaming; they are then introduced into the different compartments of the rotatory drums, formed with open rails

round the periphery, and inclosed in steam-tight boxes, of which there are a series, each drum being about ten feet diameter. In this situation of the goods, steam at a pressure of about two pounds upon the inch is let into the boxes, and the drums made to revolve slowly by bands leading from a steam-engine, by which means the steam insinuates itself through every part of the clothes as they tumble over in the compartment of the drums, and this is the *only friction* they experience during the operation of washing. A quantity of alkaline solution (soap and water) is let into the lower part of the boxes, and as the drums revolve the clothes dip into this solution, which washes off the dirt and grease that had been previously disturbed by the steam.

The operation of steaming is continued in general for about one hour, more or less according to the state and quality of the articles, the alkaline matter is then drawn off, and clear hot water introduced into the steam boxes in its place, which as the drums continue to revolve, rinse the cloths, and remove every particle of the soap. When this has been effected, the water is drawn off, and after the steam has acted alone for a short time upon the clothes, the stop-cock is closed, and the door of each steam box opened, when the articles are carefully withdrawn from the drums, and carried in skeleton barrows to the examining bench. Here every article is opened and carefully looked over, when if any spots remain, which is a rare occurrence, the article is returned for a second operation, and those approved passed to the blue vat.

It is not necessary that all the articles should be either coloured or stiffened, but such as need it are dipped into a vat containing cold water with a small quantity of starch and blue; from this they are withdrawn, and without wringing, spread upon a board which conducts them be-

tween two plain rollers for the purpose of squeezing out the water. The clothes are then carried in baskets to the drying rooms, where they are opened and hung upon wooden rails.

The sides of the drying rooms are made with horizontal shutters or weather-boards hung upon hinges, which in fine weather are opened, and by the wind passing through the clothes are speedily dried; but in damp weather the shutters are closed, and the rooms warmed by a series of steam pipes passed in different directions through the building, from which heat radiates, and the steam evaporated from the clothes is allowed to pass off through ventilators.

When dry, the articles are removed to be folded, and then taken to the ironing or mangling rooms; and here we must, in justice to the women employed in this department, publicly state, that we have seen the most costly worked muslin dresses finished by their hands in a style of neatness not to be surpassed.

The woollen goods, such as great coats and blankets, are equally well finished by the assistance of brushing and dressing machines, and indeed the facilities and conveniences afforded by so large an establishment, are such as require to be seen to be fully appreciated. But the advantages which must, above all others, recommend it to the approbation of the public are that linen and other clothes, as well as draperies of domestic use, are here rendered perfectly clean without the destructive operations of *rubbing and wringing*, which in the usual mode of washing is far more injurious to the fabric than the ordinary wear; and it is also perfectly evident that no other chemical materials are employed to whiten the clothes than soap and water.

Several of these establishments are intended to be formed in different parts of the kingdom, and also in France, where a patent has been just obtained.

Casting Wooden Ornaments and Veneers.

A discovery has lately been made in France of a method of converting pulverized wood or sawdust into a plastic and ultimately into a solid substance, by which means the most curious wooden articles can be produced out of rare and costly woods at a small expence. This substance when prepared in considerable masses, may be cut into slabs or veneers, or it may be moulded into the shapes of parts of furniture, intead of carving or turning the natural wood out of the solid as heretofore. The artificial has a perfect resemblance to the real wood, and even an excellent imitation of marble is produced by these means.

The discovery is thought to be of considerable importance, but the process is at present secret. It will shortly be offered to speculatists in the English markets, and will in all probability become the subject of a patent of importation.

Railways and Canals.

An able paper appeared in the *Scotsman* on the relative advantages of railways and canals. The object is to ascertain the relative merits of roads, railways, and canals, for which purpose the writer calculates the degree of resistance a carriage or vessel meets with, either from friction or the pressure of water, in each of these modes of conveyance. From these calculations, it appears that a horse will draw a load ten times as great upon a railway, and thirty times as great upon a canal, as he will upon a good road. When the horse moves at the rate of two miles an hour, therefore, a canal is the most advantageous mode of conveyance; but when the speed is increased, the case is very different. With regard to the expense, the writer estimates the cost of a railway at three times the cost of a good turnpike road, and that of a canal about nine or ten times. If railways, there-

fore, should come into general use, two-thirds of the expense of transporting commodities would be saved, as, though the first cost of the railway is *three* times that of the road, the same force will move *ten* times the weight over it. Railways, then, it is obvious, afford prodigious facilities over any other mode of conveyance, both as regards time and expense; and the *Scotsman* observes, "that there is scarcely any limit to the rapidity of movement these iron pathways wiil enable us to command," or to the improvements in trade, commerce, and even agriculture, which they will allow us to effect.—The writer of the article in the *Scotsman* adds the following:—"Having some years ago been in Italy, I was delighted with the granite rail-roads in the streets of Milan. In every narrow street one road is laid in the middle, and in broad streets a rail-road on each side. The stones are perfectly flat, not grooved, and two feet wide for each wheel. What a comfort would it be to the citizens of Edinburgh were rail-roads of this description laid down in the ill-paved streets of this city: whinstone abounds in the neighbourhood, well suited to this purpose."

Polytechnic and Scientific Intelligence.

Royal Society.

Thursday, the 18th November, this Society commenced their weekly meetings for the present season, when Captain Douglas Charles Clavering, R. N. was admitted a fellow, and the Croonian Lecture by Sir Everard Home, Bart. was read.

The object of this lecture is to show that the existence of nerves in the fœtal and maternal portions of the pla-

centa, and which the author endeavours to prove from a microscopic examination of the placenta of the seal, and the pregnant uterus of the Sumatrian Japir. He then proceeded to offer an opinion on the uses for which these nerves are intended, and concluded that they probably serve to establish a connection between the brain of the mother and its offspring, and hints that the connection may possibly account for some of the extraordinary instances of the influence of bodily and mental affections of the mother on its offspring.

Another paper by the same author was also read, on the changes which the Ova of the Frog undergo from the time of its impregnation until the formation of the tadpole is completed. The author says, that the membrane forming the vesicles which contain the embryo, serve the same purposes as the shell and internal membrane of a pullet's egg —and thinks that the black matter which lines the vesicle is intended to defend the young tadpole from the scorching rays of the sun.

Thursday the 25th.—The Society held their second meeting, when a paper by W. Whewell, esq. was read, on a General Method of calculating the Angles made by any Planes of Crystals, and the laws according to which they are formed. The President announced the Anniversary Meeting of the Society, which is to be held on the 30th Instant, and also the resignation of Taylor Coombe, esq. one of the Secretaries.

On the 30th November, the Society met for the purpose of choosing a President and Council—when a list of the Members admitted in the course of the preceding year, and the deaths which had occurred in the Society during the same period, having been read, the President rose, and after paying a suitable compliment to the memory of the late Mr. Baron Maseres, whom he characterized as an

active member of the Society, a laborious mathematician, and a liberal patron of the science, he proceeded to announce the award of the Gold Copley Medal to the Rev. Dr. John Brinkley Andrews, Professor of Astronomy, in Trinity College, Dublin, for his various communications to the Society.

The adjudication of the medal in two successive years for papers on the same subject, and to two persons so directly opposed to each other in opinion, he observed, might occasion surprise to those who were unacquainted with the grounds on which the Council proceeded on these occasions. The presentation of the Copley Medal was not to be supposed to have any reference to the hypothetical opinions of either, but merely as an expression of the high sense which the Society entertained of their meritorious exertions in the cause of science; and in this view, it must be admitted, that both the Astronomer Royal and Dr. Brinkley were entitled to the distinguished mark of approbation bestowed on them by the Council.

The President then enumerated the titles and contents of the papers communicated by Dr. Brinkley, and printed in the Philosophical Transactions. He particularly noticed the two great points on which our distinguished observers are at issue, namely, the parallax of certain fixed stars, and a Southern motion of them. He entered at some length into a history of the attempts that had been made to discover sidereal parallax, from the days of Copernicus to the present time, and observed, that astronomers were still much divided in opinion on this important subject; but that with respect to a southern motion, the most eminent were generally against its existence. He concluded by complimenting the Astronomer Royal and Dr. Brinkley on the temperate manner in which they had carried on this interesting discussion—and congratulated the Society on

the flourishing state of astronomy both in this country and on the Continent, and on the prospect it afforded of still further improvements and discoveries in that noble science.

The Society then proceeded to ballot for a President and Council for the ensuing year, when the following gentlemen were elected:—

Of the old Council—Sir Humphrey Davy, Bart., Wm. Thos. Brande, esq., Samuel Goodenough, Lord Bishop of Carlisle, Major Thomas Colby, John Wilson Croker, esq., Davies Gilbert, esq., Charles Hatchett, esq., Sir Everard Home, Bart., John Pond, esq., Astronomer Royal, Wm. Hyde Wollaston, M.D. and Thomas Young, M.D.

Of the New Council—William Babington, M.D., Francis Bailey, esq., John George Children, esq., John William, Viscount Dudley and Ward, John Frederick William Herschel, esq., Captain Henry Kater, Thos. And. Knight, esq., Alex. Mac Leary, esq., Sir Thos. Stamford Raffles, Edward Adolphus, Duke of Somerset.

Officers—Sir Humphrey Davy, Bart. President.

Davies Gilbert, esq. Treasurer.

William Thomas Brande, esq., and John Frederick William Herschel, esq. Secretaries.

On the 9th December, the Society held one of their ordinary meetings, when Charles Mackintosh, esq. was admitted a member, and three papers were presented from Sir Thomas Brisbane, containing observations made with a Transit Instrument and Circle, on Stars in the Southern Hemisphere, from which the right ascensions of about 2200—and the declinations of nearly 8600 are accurately determined.

On the 16th, the Society met again, when John Bell, esq. and Sir Charles Wetherell, H. M. Solicitor-General, were elected fellows; and a paper was communicated by Dr.

Mark Roget, on an optical deception in the appearance of the spokes of a wheel seen through vertical apertures. This paper is intended to explain an optical deception which constantly takes place, when the wheel of a carriage in motion, is attentively viewed through vertical bars, such as the rails of a palisade, or the laths of a Venetian blind. Thus circumstanced, the spokes appear to bend downwards, and more or less so, as they are situated further from or nearer to the spoke which happens to be vertical, and which always appears to be perfectly straight.

Dr. Roget explains this curious phenomenon, by supposing that the impression made on the retina by a pencil of rays, when sufficiently vivid, continues for some time after the cause has ceased, and thinks it possible to estimate the actual duration of any impression on that organ, from the apparent velocity of the spokes.

A paper on a new photometer by Mr. Ritchie, of the College at Tane, was also read.

This photometer is described as consisting of two broad flat cylinders, closed at one end by a tin plate, and at the other by a thick plate of glass, and in the middle of each is a piece of black paper. The cylinders are connected by a bent tube, containing a small quantity of coloured liquid, and with their tin ends facing each other. By exposing the glass faces of the cylinders to two lights, their comparative degree of strength is ascertained, the fluid moving from the stronger towards the weaker light; and so sensible is this instrument described to be, that a single candle at the distance of thirty feet visibly affects it, and the solar light is sufficiently powerful to drive the liquid through from twenty to thirty feet of tube. With an instrument now making, the author expects to be able to render sensible the effects of the moon's rays.

On the 23rd, the Society held another meeting, when

Captain Frederick William Beechy was elected a member, and two papers by the Rev. Baden Powell were read, containing some observations and additions to a paper communicated to the Society last year, respecting the supposed invisible heating effect beyond the red end of the prismatic spectrum.

The Society then adjourned to Thursday, the 13th of January.

ASTRONOMICAL SOCIETY OF LONDON.

10th December, 1824.

At the meeting of the Society, this evening, the publication of the second part of their Memoirs was announced.

The following papers were read:—

1. A Description of a Box of Rods, named the *Rhabdological Abacus*, presented to the Society by the family of the late Henry Goodwin, Esq. of Blackheath, drawn up by Dr. Gregory; by which it appears, that these rods were invented by Mr. Goodwin, for the purpose of facilitating the multiplication of long numbers of frequent occurrence. They were probably suggested by Napier's rods, and are, for the purposes which the inventor had in view, a great improvement upon them. The rods, which are square prisms, contain on each side successively, the proposed number in a multiplicand, and its several multiples, up to nine times; and these, in the several series of rods, are repeated sufficiently often, to serve for as extensive multiplications as are ever likely to occur. Thus, if the four faces of one rod contain respectively, once, twice, three times, and four times, a proposed multiplicand, another rod will exhibit, in like manner, twice, three times, four, and five times the same; a third rod, three, four, five, and six times the same; a fourth rod, four, five, six, and seven times the

same multiplicand; and so on to nine; and in several cases, more rods.

The numbers are arranged uniformly, upon equal and equi-distant compartments; while at a small constant distance to the left of each product, stands the number 2, 3, 4, 5, &c. which it represents. Hence, in performing a multiplication, the operator has only to select from the several faces of the rods, the distinct products which belong to the respective digits in the multiplier—to place them in due order above each other—to add them up while they so stand, and write down their sum, which is evidently the entire product required, and obtained without the labour of multiplying for each separate product, and even of writing those products down. For still greater convenience, the rods may be arranged upon a board, with two parallel projections placed aslant, at such an angle as of necessity produces the right arrangement. There are blank rods to place on those lines which accord with a cypher in the multiplier; and the arrangement may easily be carried on from the bottom product upwards, by means of the indicating digits.

2. A letter from Captain Ross, a member of this Society, giving an account of observations made on the occultation of Jupiter, by the moon, on the 5th of April last, transmitting also an account of observations upon the same occultation, by Mr. Ramage of Aberdeen, with one of his own twenty-five feet reflecting telescopes. Mr. Ramage observed the *Immersion*. On the approach of Jupiter's satellites to the moon, no diminution of their light was perceptible. On coming into contact with the moon's dark limb, they did not disappear instantly, like fixed stars, but formed an indentation or notch in the limb, as if they were imbedded in it, but were at the same time separated from it by a fine line of light. This indentation continued visible until about *half* their diameters were immersed, when it disappeared.

All the satellites presented this phenomenon, but the fourth and third with the greatest distinctness. On Jupiter's approach, no difference of his light or shape was perceptible; but after the contact had taken place, he appeared to exhibit no deficiency of disc, but presented a complete figure, as if placed between the moon and the earth,—this appearance continuing for a few seconds. When the planet was almost entirely immersed, his retiring limb appeared as though it were considerably elongated, or formed a segment of a much larger circle than had been previously presented. The position of Mr. Ramage's telescope did not allow him to observe the emersion.

Captain Ross was prevented by the state of the weather from seeing the *immersion*, but was fortunate enough to observe the *emersion*,—seeing first a considerable *elongation*, which gradually diminished as more of the planet appeared from behind the moon.

3. Part of a letter from Mr. R. Comfield, a member of this Society, in reference to the same occultation. He observed it at Northampton, with a good Newtonian reflector. Mr. Comfield and two other contemporaneous observers, with good instruments, noticed, that when Jupiter had about half disappeared, there was exhibited an adhesion or protuberance on each side of the planet, which, as Jupiter sunk behind the moon, became larger and larger; so that just before the entire disappearance of the planet, it exhibited a considerable elongation, deviating greatly from a circular curve of the same diameter as the planet.

Phenomena somewhat analogous, especially in reference to the indentations and adhesions, were noticed by several astronomers who observed the transit of Venus in 1769. See the account by Captain Cook, Mr. Charles Green, Mr. Charles Mason, M. Tingré, &c. in the Philosophical Transactions for 1770 and 1771; which are here adverted

to, because the consideration of kindred phenomena may assist in the explication of the whole.

SOCIETY OF ARTS.

On Wednesday the 3rd of November, the meetings of this Society were resumed for the present session, and the following subjects have been submitted to the examination of its committees:—

Committee of Mechanics.

On an application of the centrifugal governor to cranes, or other similar machinery, in which the divergence of the balls is made to operate on a brake wheel:—A proposition to prevent accidents in descending mines, by the addition of a parachute above the bucket:—A stand for beer barrels, having a screw behind, to tilt the cask when requisite:—A cork float, to prevent drowning, in case of shipwreck:—A sash window, which allows of being cleaned without getting outside for that purpose:—Two safe-coaches, having props on the sides, to prevent overturning:—A mode of cutting screws in the lathe:—A net for taking smelts:—A substitute for the crank in steam-engines, effected by three bevel-wheels:—a spirit-level, having a moveable leg on the frame, which being set at right angles, answers the purpose of a plumb-rule:—A magnet, to extract particles of iron from the eyes of workmen:—An improved key for door-locks:—A quicksilver pump:—An air-bed, composed of a number of air-tight bags, enclosed in a ticken case:—A proposition for making large lenses of a number of pieces:—A fire-escape, consisting of a derrick raised upon a common fire-engine, and having a pulley at the top, over which is passed a rope having a basket attached to the end:—A safety-valve for a steam-engine. Instead of the ordinary conical valve, a small piston is fitted to a cylinder, and is kept

down by a helical steel spring, and the piston-rod rising in front of a graduated scale, indicates the pressure of the steam in the boiler:—A pump bucket, with two flaps nearly similar to the ordinary ones:—A crab or windlass, composed of an endless screw and wheel:—A lock, on the old principle of lettered cylinders; and a mode of escaping from a house on fire, by a basket and rope, or chain passed through two pullies in the front of the adjoining houses.

Committee of Colonies and Trade and Mechanics.

A claim for eradicating stumps of trees:—A substitute for cork:—On the diminution of human labour, in the cultivation of sugar, &c. in the West Indies:—A chart of British trade; and a specimen of blue gum wood from New South Wales.

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1. *Proceedings of the Royal Society of Edinburgh.*

November 15*th.* — The Royal Society resumed its sittings for the winter.

A paper was read by Mr. Haidinger, on the determination of the Idea of the Species in Mineralogy, according to the principles of Professor Mohs.

The purpose of this paper is to show, that in the determination of the species, no attention should be given to the chemical properties of bodies, that is, to those which are observable while a mineral ceases to exist; but that every property should be taken into consideration, which minerals exhibit in their natural state. Bodies which agree in this respect either entirely, or in which the differences in their characters may be joined by continuous series, belong to one and the same species. Chemical considerations on the composition of minerals are then only conclusive, if the species has been previously determined; and a comprehensive knowledge of them can only be obtained, if we do not slight any of the proper-

ties of minerals, which has but too frequently occurred, by supposing that in mineralogy there is nothing so satisfactory as the chemical composition of a body.

November 22.—At a General Meeting of the Society, held this day, the following office-bearers, were elected:—

Sir Walter Scott, Bart. President.

Right Hon. Lord Chief Baron,
Lord Glenlee,
Dr. T. C. Hope,
Professor Russell,
} Vice Presidents.

Dr. Brewster, Secretary.

Thomas Allen, Esq. Treasurer.

James Skene, Esq. Curator of the Museum.

Ph sical Class.

Alexander Irvine, Esq, President.

John Robison, Esq. Secretary.

Counsellors.

Rev. Dr. Macknight,	James Jardine, Esq.
Robert Stevenson, Esq.	Sir William Forbes, Bart.
Sir William Arbuthnot, Bart.	Dr. Home.

Literary Class.

Henry Mackenzie, Esq. President.

Peter F. Tytler, Esq. Secretary.

Lord Meadowbank,	Rev. Dr. Lee,
Professor Wilson,	The Rt. Hon. the Lord Advocate.
Sir W. Hamilton, Bart.	Henry Jardine, Esq.

December 6.—At this meeting, there was read by John Cay, Esq. a notice respecting two Ancient Graves, discovered at North Charlton, parish of Ellingham, Northumberland, in January, 1823.

At the same meeting, there was read Observations on the Vision of Impressions on the Retina, in reference to certain supposed discoveries respecting Vision, announced by Mr. Charles Bell.

Abstracted Report of the Select Committee of the House of Commons, on Machinery and Artizans, &c.

(Continued from Vol. viii. p. 275.)

MR. ALEXANDER GALLOWAY, further examined.

The French engineers have become very shrewd. If their employers will only take of them such articles as cannot be procured from England, they decline furnishing any part; —they will either make the whole of the machinery, or they will make none of it. Mr. G. considers, that English machinery would be preferred all over the world, not only because our engine work is better made, but also because we can furnish it cheaper; the reason of which is, that the price of the materials, both metal and coal, are lower in England, and the tools for manufacturing, already constructed, as well as a variety of other circumstances which conspire in our favour.

Mr. G. stated, that during the years 1817, 18, 19, and perhaps 20, which were the slackest periods that he remembers, from his own knowledge of the engineering business, if the prohibitory laws had not existed, orders might have been executed in London, that would have employed from six hundred to a thousand workmen, who were out of work during that period, and thereby placed in a state of temptation to leave the country, and many of whom did actually emigrate at that time.

On being asked if a very large capital was not necessary to establish such a manufactory as his, replied, that within the last three years, he had spent 30,000l. upon one manufactory, beside taking into it all the machinery and tools which he possessed before 1821. Artizans are now in general fully employed here; and the repeal of the laws prohibiting their leaving the country, would in all probability induce a vast number to return, the example of whom would be most salutary and useful.

Drawings and Specifications can be obtained in this country by any foreigner with the greatest facility, and in some instances, printed copies of Specifications can be had for three shillings. The Society of Arts publish annually a volume, with every new invention that they think worthy of notice; it is the principal object of their labours, that the drawings and description there given should enable any foreigner to make the articles. Hence the publication of that Society, and of every other tending to extend scientific knowledge, are in direct opposition to the laws in question.

Mr. G. is acquainted with M. Dupin; he is a man possessing great mechanical knowledge; every facility has been afforded him in seeing our naval and military arsenals; some gentlemen from Holland and other parts of the Continent have also had the same facilities. M. Dupin has published plans of every description of machinery used in those arsenals, he saw every thing in our dock-yards and factories that any native of this country is admitted to see. M. Dupin perhaps was not admitted to Bolton and Watt's factory; they have always displayed an uncommon degree of mystery, and have shut their works against Englishmen whom they thought to be competent judges, therefore foreigners are no worse treated than other people; but Mr. G.'s decided opinion is, that they have nothing to shew beyond what is well known elsewhere, and they now continue from pride that exclusion which before was dictated by interest.

A foreman of Mr. G.'s went to Russia, with many other English workmen who were enticed away, they were principally settled at Tula, near St. Petersburgh. Mr. G. has furnished a considerable quantity of turning machinery and saw mills, to a manufactory there, in which six hundred or a thousand men are employed at a time. Mr. Thorow-

good, who has the superintendence of the Government Works at St. Petersburgh, was in Mr. G.'s employ—he has been in Russia about six years.

Mr. G. is acquainted with the lace-making machinery; it was for a considerable quantity of bobbin net machinery that Mr. G. was obliged to decline an order from two individuals amounting to £30,000, which machinery has been since made in France, and other parts of the Continent. They make the best bobbin-net-machines,—but a considerable quantity of English lace has been sent to France, and bought by the natives as their own manufacture, and afterwards sold to the English as French lace.

The Custom-house officers have been in general more rigid in preventing the exportation of machinery to France and North America than elsewhere, they have been less scrupulous as to South America; indeed the utmost liberality has been shewn, and it was only in cases where it was impossible to shut their eyes that they have kept them open. There are few impediments to sending machinery to South America, and Mr. G. believes he has sent more than any other individual in London. The reason why there would probably be a further demand in that market if the prohibitory laws were repealed, is that such goods only have been sent as were allowed by law to pass, without considering the wants of the people; indeed most of the shipments have been open, and speculative orders sometimes rather beyond the letter of the law, because for South America they would be allowed to pass, but for France or North America they would have been prohibited.

The bobbin-net machinery made in France, can scarcely be equal to ours, though they approximate nearly, and the cost there is 50 or 100 per cent. more than in England. But lace machinery is not to be put in competition with other machinery, for, after all the parts are completed by the

maker in France, it is impossible to work with it until the whole has undergone a most careful and skilful adjustment, which takes as much time as would be required to make the machine in England. The cost of such machinery depends entirely upon its capacity—from 400l. to 800l., and the prime cost of the materials of the latter would not exceed 50l.—the rest is labour.

The duty on the importation of machinery into France is fifteen per cent. on machinery in general, and thirty per cent. for steam engines. Mr. G. believes, that the duty has been lately doubled. Upon all new inventions, there is a power of evading the duty in France, by taking a *brevet of invention.* There has been a quantity of machines for shearing cloth lately made in France, by an Englishman named Collier, who has a manufactory in Paris, from whence he has sent some to this country. The custom-house officers stopped eight of them last year, for the purpose of ascertaining their object and the probable cost if made in England, which Mr. G. was called upon to determine, and upon that valuation fifty per cent. was charged as an English duty.

There is a great loss in making experiments to improve machinery; there is scarcely a machine that is made, however simple and correct in its principles, but has cost an immense expence before it was brought into practical operation, so as to be employed by ordinary workmen. A capital therefore is necessary to bring any new invention to maturity, and for that purpose, there are quite as many monied speculators in France as in England.

There is a great predilection among the French for engineering, and there is an amusing partiality there for English machinery, which cannot be easily eradicated. Mr. G. is quite sure that if he were to open a shop in

Paris, and to state that his machinery came from England, it would fetch a better price than if it was known to have been made there; they have so great an opinion of English capability.

Besides the manufactories of machinery in Paris and its neighbourhood, there are other very extensive establishments at Lyons, Rouen, Abbeville, and Orleans, in which they are making immense progress. Indeed, such is now the state of machinery in France, that the repeal of our laws will be rather a day after the fair; and though there is a predilection in favour of English machinery, that may be kept down by the French government by imposing new duties.

Their bar iron is not quite so good for many purposes as ours, but it is capable of being made equal under an improved manufacture. They do not use Swedish iron in any great quantities, it is highly carbonized, and therefore is in a very forward state for converting into steel. Many people in this country think that good steel cannot be made from English iron, that is a mistake, it cannot be made at the same price as from Swedish iron, but the extensive application of iron to all the purposes of life, will render wood cheap, and then we shall soon make as good steel from our own, as from foreign iron. Swedish iron will require greater force to pull it asunder than ours, but it is not so well calculated to vibrate as the English iron.

(To be continued.)

New Patents Sealed, 1824.

To Louis Lambert, of No. 10, Rue de la Gout, in the city of Paris, in the kingdom of France, but now residing at No. 29, Cannon Street, in the city of London, gentleman, for his invention of certain improvements in the

material and manufacture of paper.—Sealed 23rd November—6 months for Inrolment.

To John Osbaldeston, of Shire Brow, within Blackburn, in the county palatine of Lancaster, calico weaver, for his improved method of making healds to be made in the weaving of cotton, silk, woollen, and other cloths.—Sealed 29th November—6 months.

To Stephen Wilson, of Streatham, in the county of Surrey, Esq. in consequence of communications made to him by a certain foreigner residing abroad, he is in possession of a new manufacture of stuffs with transparent and coloured figures, which he calls Diaphane stuffs.—Sealed 25th November—6 months.

To William Shelton Burnett, of New London Street, in the city of London, merchant, for his invention of certain improvements in ships' tackle.—Sealed 25th November—6 months.

To Thomas Hancock, of Goswell Mews, Goswell Street, in the county of Middlesex, patent cock manufacturer, for his new method of making or manufacturing an article which may be in many instances substituted for leather, and be applied to various other useful purposes.—Sealed 29th November—6 months.

To William Furnival, of Anderton, in the county of Chester, salt manufacturer, for his invention of certain improvements in the manufacture of salt.—Sealed 4th December—6 months.

To William Weston Young, of Newton Nottage, in the county of Glamorgan, engineer, for his invention of certain improvements in the manufacture of salt, part of which improvements are applicable to other useful purposes.—Sealed 4th December—4 months.

To John Hillary Suwerkrop, of Vine Street, Minories, in the city of London, merchant, in consequence of a

communication made to him by a certain foreigner residing abroad, he is in possession of an apparatus or machine, which he denominates a Thermophore, or a portable mineral or river water bath and linen warmer, and also for other apparatus or machines connected therewith, for filtering and heating water.—Sealed 4th December—2 months.

To George Wycherley, of Whitchurch, in the county of Salop, saddler, for his new and improved method of making and constructing saddles.—Sealed 4th December —6 months.

To Robert Dickenson, of Park Street, Southwark, in the county of Surrey, for his improved air chamber for various purposes.—Sealed 1st December—6 months.

To John Thompson, of Pembroke Place, Pimlico, and of London Steel Works, Thames Bank, Chelsea, for his improved mode of making refined, or what is commonly called cast steel.—Sealed 9th December—2 months.

To Robert Bowman, of Aberdeen, Scotland, chain cable maker, for his improved apparatus for stopping, releasing, and regulating chain and other cables of vessels which he denominates elastic stoppers.—Sealed 9th December—4 months.

To William Moult, of Lambeth, in the county of Surry Engineer, for his improvement in the working of water wheels.—Sealed 9th December—6 months.

To Sir William Congreve, of Cecil Street, Strand, in the county of Middlesex, Baronet, for his improved gas meter.—Sealed 14th December—6 months.

To Samson Davis, of Upper East Smithfield, in the county of Middlesex, gun lock maker, for his improvements applicable to guns and other fire arms.—Sealed 18th December—6 months.

To David Gordon, of Basinghall Street, in the city of

London, Esq., for his invention of certain improvements in the construction of carriages or other machines to be moved or propelled by mechanical means.—Sealed 18th December—6 months.

To Samuel Roberts, of Park Grange, near Sheffield, in the county of York, silver plater, for his improvements in the manufacture of plated goods of various descriptions.—Sealed 18th December—2 months.

To Pierre Jean Baptiste Victor Gosset, of Clerkenwell Green, in the county of Middlesex, for his invention of certain improvements in the construction of looms or machinery for weaving various sorts of cloths or fabrics. —18th December—6 months.

To Joseph Gardner, smith, and John Herbert, carpenter, both of Stanley Saint Leonards, in the county of Gloucester, for their invention of certain improvements on machines for shearing or cropping woollen cloths.—Sealed 18th December—2 months.

To William Francis Snowden, of Oxford Street, in the parish of Saint George, Hanover Square, in the county of Middlesex, mechanist, for his new invented wheel-way and its carriage or carriages for the conveyance of passengers, merchandize, and other things along roads, rail and other ways, either on a level or inclined plane, and applicable to other purposes.—Sealed 18th December—6 months.

To John Weiss, of the Strand, in the county of Middlesex, surgical instrument maker and cutler, for his invention of certain improvements on exhausting, injecting or condensing pumps, and on the apparatus connected therewith, and which said improvements are applicable to various useful purposes.—Sealed 18th December—6 months.

D.	H.	M.	S.	
1	1	0	0	☽ in conj. with η in Taurus.
1	8	9	27	♃'s 4th Sat. will immerge.
1	8	16	57	♃'s 1st Sat. will immerge.
1	12	0	0	♀ in conj. with γ in Cap.
1	12	39	20	♃'s 4th Sat. will emerge.
3	0	0	0	♀ in conj. with δ in Cap.
3	13	0	0	☽ in conj. with η in Gemini.
4	8	0	0	☽ in conj. with ζ in Gemini.
4	11	39	0	Ecliptic opposition ○ full moon.
4	12	35	53	♃'s 3d Sat. will immerge.
4	15	0	0	☾ in conj. with δ in Gemini.
4	16	8	1	♃'s 3d Sat. will emerge.
6	12	47	13	♃'s 2nd. Sat. will immerge.
6	15	42	5	♃'s 1st. Sat. will immerge.
6	21	0	0	☾ in conj. with ξ in Leo.
7	0	0	0	☿ Stationary,
7	1	0	0	☾ in conj. with o in Leo.
7	10	0	0	☾ in conj. with π in Leo.
8	10	10	29	♃'s 1st Sat. will immerge.
11	3	53	0	☾ in □ last quarter.
11	16	34	29	♃'s 3d Sat. will immerge.
13	15	23	41	♃'s 2nd Sat. will immerge.
13	17	35	41	♃'s 1st Sat. will immerge.
14	1	0	0	☾ in conj. with δ in Scorpio.
15	11	0	0	☾ in conj. with ϑ in Oph.
15	12	4	8	♃'s 1st Sat. will immerge.
15	13	0	0	☾ in conj. with B in Oph.
17	3	0	0	☾ in conj. with 1 ν in Sag.
17	6	32	32	♃'s 1st Sat. will immerge.
17	8	0	0	☾ in conj. with o in Sag.
17	10	0	0	☾ in conj. with π in Sag.
17	13	0	0	♀ in conj. with λ in Aqua.
17	16	0	0	☾ in conj. with ♅ long. 17° in Sag. ☾ lat. 1° 28′ N. ♅ lat. 24° S. diff. lat. 1° 52′.
18	6	0	0	☾ in conj. with ☿ long 23° in Sag. ☾ lat. 2° 5′ N. ☿ lat. 3° 21′ N. diff. lat. 1° 16′.
18	6	41	38	♃'s 4th Satt. will emerge.
18	15	43	0	Ecliptic Conjunction ● New Moon.
19	18	26	0	☉ enters Aquarius.
20	18	0	21	♃'s 2d Sat. will immerge.
22	13	57	52	♃'s 1st Sat. will immerge.
22	16	0	0	♀ in conj. with φ in Aqua.
24	7	19	18	♃'s 2d Sat. will immerge.
24	8	26	19	♃'s 1st Sat. will immerge.
25	19	0	0	☽ in conj. with η in Pisces.
26	20	24	0	☽ in □ first quarter.
28	0	0	0	☿ Stationary.
29	18	0	0	♂ in conj. with λ in Aqua.
29	18	6	51	♃'s 1st Sat. will emerge.
31	0	0	0	♄ Stationary.
31	0	0	0	☽ in conj. with η in Gemini.
31	3	0	0	☽ in conj. with μ in Gemini.
31	12	35	19	♃'s 1st Sat. will emerge.
31	12	49	6	's ♃ 2d Sat. will emerge.
31	19	0	0	☽ in conj. with ζ in Gemini.

The waxing moon ☽ — the waning moon ☾

Rotherhithe. J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, Nov. and Dec. 1824.

1824.	Thermo.		Barometer		Rain in inches.	1824.	Thermo.		Barometer.		Rain in inches.
	Higt.	Low.	+	—			Higt.	Low.	+	—	
Nov.						Dec.					
26	40	34	29,60	29,57	,025	11	46	25	30,05	30,00	,125
27	46	29	—,75	—,60	. .	12	48	34	—,30	—,10	. .
28	54	32	—,60	—,36	. .	13	49	41	—,35	—,30	,025
29	51	42	—,40	—,15	,175	14	47	39	—,35	—,25	. .
30	54	37	—,45	—,15	,075	15	50	42	—,00	29,80	. .
Dec.						16	44	30	29,86	—,80	,025
1	42	34	—,45	—,20	,575	17	42	32	—,95	—,90	. .
2	48	30	—,53	—,24	. .	18	48	33	30,05	Station	,075
3	40	32	—,62	—,35	,525	19	54	44	—,00	29,95	,025
4	41	29	—,48	—,30	,025	20	49	38	29,60	—,38	. .
5	40	31	—,86	—,43	,75	21	51	32	—,40	—,23	,025
6	43	26	—,77	—,49	,075	22	49	41	—,05	28,84	,175
7	40	27	—,60	—,40	,25	23	36	31	—,90	29,65	. .
8	45	33	—,74	—,70	. .	24	47	29	—,70	—,37	,175
9	44	33	—,67	—,54	,075	25	54	36	—,40	Station	,375
10	35	29	30,00	—,78	,125						

CHARLES H. ADAMS, LOWER EDMONTON.

LITERARY NOTICES.

A PROSPECTUS has been issued for the publication of a Universal Historical Dictionary, by George Crabbe, M. A. on the same plan as the Technological Dictionary, by the same author; it is to be comprised in Twelve parts, making two Quarto Vols.

Early in January, will appear Part I. of a new topographical work, entitled, Delineations of Gloucestershire, being views of the principal Seats of the Nobility and Gentry, and other objects of striking interest in that county, with historical and descriptive notices. The literary portion of the work by J. N. Brewer, Esq. and the drawings and engravings by Messrs. Storer, which will amount in number to 100 views, 4to size; attached to each view will be given the armorial bearings of the proprietor.

A black lead mine has been recently discovered in Inverness-shire, on the property of Glengarry. The breadth of the vein is in some parts three feet, and the quality is thought to be particularly good—Not more than two or three tons have yet been removed, and this has been taken nearly from the surface. It is bedded in slate.

Part XI. of Lodge's Portraits of Illustrious Persons has just appeared. They are all executed in the first style of excellence, and the accompanying biographies are unusually amusing. Among the portraits is one of the unfortunate Scottish Queen Mary, from the Earl of Morton's picture, painted during her imprisonment in Lochleven Castle.

Mr. Arrowsmith, the son of the late geographer, intends to publish early in 1825. a set of "Maps of the World" in 45 sheets, representing the different Countries, and their principal post roads and statistical divisions.

Mr. Hugh Campbell has in the press a historical work on an interesting portion of English History, to be entitled, "the Rival Queens, or, the Case of Elizabeth, Queen of England, and of Mary, Queen of Scots, legally and historically stated; with a true picture of Elizabeth's Amours and Private Life.

In a short time will be ready, accompanied with a Chart and Engravings, a Brief Narrative of an Unsuccessful Attempt to reach Repulse Bay, through the Welcome, in His Majesty's ship Griper, in the year 1824, by Captain Lyon, R. N.

A Manual of Classical Bibliography is nearly ready for publication, comprising a copious detail of the various editions, and translations into the English, French, Italian, Spanish, German, and, occasionally, other languages; of Commentaries and Works, critical and illustrative of the Greek and Latin Classics, by J. W. Moss, of Magdalen Hall, Oxford. It will be comprised in 2 vols, thick octavo.

Mr. Buckingham's Travels among the Arab tribes, east of Syria and Palestine, are preparing for publication in 1 Quarto vol.

A Journal of Science is, we have been given to understand, about to be published in Dublin, under the title of "the Dublin Philosophical Journal and Scientific Review." It is to appear in half-yearly periods, the First Number to be ready in the beginning of March.

Chronicles of London Bridge, by an Antiquary of London; in which will be given a complete history of that ancient and interesting structure; is nearly ready for publication.

Dr. William Mosely, of Sydney College, Cambridge, has in the Press "the Prosodian's Alphabetical Directory; or, Ready Guide to the Quantity of every Syllable in the Latin Poets.

LUNAR MAP.—M. Lohrmann, of Dresden, is about to publish a complete set of Lunar Maps, which exhibits the face of the Moon in portions, upon a large scale, and with a degree of accuracy that has not been before attempted. It is spoken of in very high terms on the Continent.

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No. L.

Recent Patents.

To John Malam, *of Wakefield, in the County of York, Engineer, for his Invention of a New Mode of Applying Certain Materials hitherto Unused for that purpose, to the Construction of Retorts; and Improvements in the other Parts of Gas Apparatus.*

[Sealed, 18th August, 1823.]

The Patentee commences his specification by saying, that his "new mode of applying certain materials hitherto unused for that purpose to the construction of retorts, consists first in the mode of constructing the retorts; and, secondly, in the combination of such materials, which are new in that particular application."

Retorts for generating carburetted hydrogen gas have been commonly moulded from fire-clay into one entire vessel at the kiln; and thence conveyed, at considerable expence and risk of breaking, to the gas-works at a distance. This circumstance necessarily limited their dimen-

sions to a portable size; and to obviate such limitation, which is thought to be disadvantageous, the patentee proposes to construct his improved retorts, and, at the same time, fix them in the very furnace where they are to be used for the distillation of the coal; by which contrivances he is enabled to make retorts of any form and magnitude that may be found desirable, without the difficulty and risk of conveying them from the kiln to the gas-works.

The new materials of which these retorts are to be composed, are pulverized fire-stone (such as may be found in the neighbourhood of the Thorncliff Iron-works, Yorkshire,) say about ten bushels, with which about twenty or thirty pounds of red lead is to be mixed, and a sufficient quantity of bullock's blood to enable the whole to be worked up into a paste. To this paste about twenty bushels of the ordinary fire-clay is to be added, and the whole worked into a stiff consistency fit for moulding. Having prepared these materials, the retort is to be constructed within the furnace, a section of which is shewn in plate III. fig. 1.

Arches of fire brick are thrown over the furnace to support the retort, and between these arches the heat is to pass and envelope the retort. Having formed the furnace in the usual way, as high as the intended situation of the bed of the retort, and completed the upper side of the arches *a a a*, the spaces between these arches are to be made up with boards, so as to produce an even surface. Upon this as a bed, the bottom of the retort *b* is formed by depositing a sufficient quantity of the above composition, which is to be beaten and pressed down until it assumes a solid compact substance of about five inches thick. Wooden frames, of a curved form, are then placed in erect positions, at suitable distances apart, upon the bed, which

are to be boarded lengthways, for the purpose of supporting the top and sides of the retort. The composition is then to be deposited upon this boarding, and pressed or beaten down as before stated, until the entire figure of the retort is completely formed. The upper part of the furnace may now be erected with its flues, by which the retort will be covered in ready for baking; the wood work in the interior being gradually withdrawn as the composition becomes dry. To enable the front part of the retort to be properly baked with the rest, it will be necessary to construct a temporary cavity of brick work, as shewn by dots in the figure, and to allow a flue to pass from the furnace through this cavity, for the purpose of bringing the heat to act upon the mouth of the retort; and when it has been properly baked, the temporary cavity is to be removed.

The principal objects of the improved furnace being to economise fuel, and to save the labour of constant attention, grate-bars are dispensed with, and a sufficient quantity of coal is to be deposited in the furnace at one time to supply it with fuel for about eight hours' consumption. The coal is introduced through the door *c* to the bottom of the furnace *d d*, where it is to be lighted on the surface, and will burn downwards when the coal has become properly ignited. The door may then be closed, and currents of atmospheric air admitted through lateral apertures *e e e*.

The improvements claimed under this head are first in the composition employed for making the retort, viz. pulverized firestone, with red lead and bullock's blood, which prevents the retort from cracking; and, secondly, the constructing and baking of the said retort in the very furnace where it is to be ultimately used.

The improvements proposed in other parts of gas

apparatus apply to the purifying process and to the gasometer. The improved purifying apparatus consists of a particular arrangement of several vessels employed for that purpose, and the adaptation of a shifting valve which applies to a combination of any number of purifiers from three upwards.

Fig. 2 is a plane or horizontal view of four purifiers, with shifting valve in the centre. Fig 3 is an elevation of the same, one of the purifiers being shewn in section, for the purpose of exhibiting the interior. Fig. 4 is a vertical section of the shifting valve, upon a larger scale, shewing the passages through which the gas proceeds. Fig. 5 is an horizontal section of the water vessel and the pipes rising through it, which forms the lower part of the valve; and fig. 6 is a like section of the shifting part shewn detached, the similar letters referring to the same parts of the apparatus in these five last-mentioned figures. The object of this arrangement of the purifying vessels is, that the gas may be permitted to pass through a series of three purifiers in succession, each containing the slacked lime, potash, breeze, or other materials, in different stages of saturation, the gas proceeding last through that vessel which contains the purest material; and the fourth vessel being at that time out of action may be re-charged with a fresh supply.

A, B, C, D, are the four purifying vessels; E is the case enclosing the shifting valve. The gas must be supposed to enter the apparatus at the pipe *a*, which leads from the retorts; proceeding up the tube *b* (see the sections, fig. 4, 5, and 6,) it enters the cavity *c* of the shifting valve, and passes thence through an opening into the compartment *d*, and through the pipe *e* into the purifying vessel A, (shewn in fig. 2, with the cover removed.) The manner in which the gas proceeds may now be best per-

ceived by reference to the section of the purifying vessel shewn in fig. 3. The gas entering this vessel by the pipe *e*; rises through the several layers of lime and other materials, placed on the perforated trays one above the other, and after passing through the upper tray into the top part of the vessel, descends by the passage *f*, and thence proceeds along the pipe *g* into the compartment *h* of the shifting valve, which compartment encloses the mouths of the pipes *g* and *i*. The gas now proceeds by the pipe *i* into the second purifying vessel B, (seen in fig. 2 with its cover on,) and after rising through the trays contained therein, it proceeds by the pipe *k* into the compartment *l* of the shifting-valve, which encloses the mouths of the pipes *k* and *m*. The pipe *m* conducts the gas from the compartment *l* into the purifier C, and after passing through that vessel, it returns by the pipe *n* to the shifting valve, and enters the compartment *o*. The gas now rises through the opening in the top of the shifting-valve, (see fig. 4,) into the case E, and thence descends by the tube *p* and proceeds to the gasometer.

It will now be perceived by the situation of the partitions of the shifting-valve, shewn by dots in Fig. 5, that the pipes *q* and *r*, communicating with the vessel D, (which is shewn as empty,) are insulated, the compartment *s* having no communication with that part of the shifting valve through which the gas passes. The purifying material in the vessel A, having become so much saturated with sulphur and other matters taken up from the gas, as to render it no longer capable of carrying on the purifying process; the vessel D is now to be provided with lime and other materials, placed on trays as before described; and in order to cut off the gas from the vessel A, and introduce it to the vessel D, the shifting-valve must be raised, which is done by turning the handles of the

screw *t*, fig. 3, until the lower edges of the partitions, (seen at fig 6,) of the valve are above the mouths of the pipes, seen at fig. 5; this will be known by the guide *v* having risen above the ribs on the side of the columns, when the valve may be turned one quarter round and again lowered, the guide passing into the groove of the next column. By these means, the compartment *d* of the shifting valve, will be removed from the pipe *e*, and placed over the pipe *i*, the compartment *h* then covering the mouths of the pipes *k* and *m*, and so on. Hence the course of the gas will now be through the vessels B, C, D. the vessel A being out of operation, which may be cleaned by taking off the cover, and fresh lime introduced. In the same way the vessel B may be cut off, and the gas turned through the vessels C, D, and A, and so on, changing the position of the shifting-valve as often as the material in the first vessel becomes saturated, by which means, the gas in its most impure state will pass first through that vessel where the purifying material has been longest acted upon, next through the second vessel, and last, through the vessel containing the fresh material.

This plan of passing the gas through several vessels, so as to change the purifying materials without stopping the process, may be modified upon a small scale in one machine, a vertical section of which is exhibited at fig 7, and an horizontal section, shewing the fixed water vessel with the place of the moveable apparatus in dotted lines at fig 8, the letters referring to the same parts in both figures; A A, is the fixed vessel holding water, through which the gas pipes rise; B B B, the moveable apparatus containing the purifying material, placed upon trays, one above the other as in the former machine. This moveable apparatus is divided into four separate compart-

ments, three of which are intended to be in action, while the material is removing from or replacing in the fourth; *a* is the pipe that conducts the gas from the retorts into the first compartment *b* of the purifyer, here the gas rises through the trays and then descends by an elongated passage into the box *c c c*, from this box it proceeds through the pipe *d*, and rises into the second compartment, when after passing through the purifying material, it descends again through a similar elongated passage, and proceeds through the pipe *f*, to the third compartment *g*, from whence it descends as before, and passes through the pipe *h* to the gasometer.

The purifying material in the first vessel *b*, having become saturated, in order to shift the compartments of the purifyer, the handle or winch *i* is to be turned, which by actuating the axle and bevel-gear *k*, causes the central shaft *l* to turn. This shaft has a thread or worm formed upon it, and this worm by working in a nut or hollow screw at the bottom of the central tube *m*, raises the moveable apparatus above the mouths of the gas pipes, and enables it to turn round one quarter, so as to cut off the first purifying compartment from the gas way, and bring the fourth compartment into action, when the apparatus is again lowered.

The last improvement proposed, applies to gasometers, and consists in a mode of regulating their ascent and descent, so as to keep their sides at all times in an erect position; fig. 9, is a vertical section of a gasometer with its water tank. This gasometer is suspended by means of chains passing over pullies, supported from three or more columns near the edge of the tank, the reverse ends of the chains having balance weights. In order to prevent the gasometer from hanging otherwise than level when it rises or falls, horizontal shafts *a a* are placed

with pinions at their outward extremities, which work into racks *b b*, fixed to their columns, and also with pinions at their inner extremities taking into a central bevel-wheel inclosed in a box *c*. By this arrangement, whenever the gasometer rises or falls on one side, the rack in which the pinion works causes the shaft to turn, and by that means the central bevel wheel is also turned, which actuates the other horizontal shafts *a*, and causes the opposite sides of the gasometer to rise and fall also, and in the same proportion.

[*Inrolled, February,* 1824.]

To Thomas Gethen, *late of Henry-street, Pentonville, in the County of Middlesex, but now of Union-street, Southwark, in the County of Surrey, Gentleman, for his new invented Improvements in the Machinery and Process of Making Metallic Rollers, Pipes, Cylinders, and certain other Articles.*

[Sealed 15th April, 1824.]

This invention principally applies to the making of leaden pipes, and consists first in causing the moulds in which such pipes are to be cast, to travel so that the fluid metal discharged from the runner of a stationary melting pot may be enabled, by the progressive movement of the mould, to produce a more extended length of casting than can be effected by the ordinary mode of running the metal; and, secondly, in the particular construction and adaptation of a core with a porous coating, and channels for conducting off the steam and other vapour from the mould. The advantages of this improved apparatus and process are, that pipes may be cast in very considerable

lengths with great facility (that is, twenty, thirty, or forty feet long or more), and at the same time produce a much more sound and compact adhesion of the particles of the metal, than has ever been affected by the known processes of casting and drawing pipes.

To those practically acquainted with casting lead, both in pipes and sheets, the frequency of unsound and porous places in the casting is well known, and the consequent injury in the article, to the loss both of the maker and user. This defect is principally attributable to the expansion of confined air within the mould, which is completely obviated by the present improved mode of casting. The process of rolling sheets and drawing pipes hitherto practised for the purpose of reducing the thickness of the casting, forces the particles of the metal to roll over one another and expand the surface lengthways, but at the same time encreases and elongates the defective parts, causing the metal where the cohesion is not perfect to break into laminæ and lateral cracks, and by the variations of temperature and mechanical force to which it is afterwards exposed when in use, these unseen cracks soon cause the metal to burst asunder.

The patentee therefore, has adopted a mode of carrying off the air from the mould, and proposes to cast pipes of such thicknesses as shall not require drawing in order to render the adhesion of the metal uniform throughout, and to avoid the lateral cracks which the process of drawing will sometimes produce, even in previously sound castings. These objects, as far as our own observation has gone, appear to have been fully effected by the patentee; for (besides the expedition with which the castings are made,) the soundness and perfect adhesion of the metal when portions of the pipe have been cut open and compared with what is considered to be good pipe made in

the ordinary way, has so much the advantage in the specimens we have seen, that in addition to the economy of labour, it must be admitted that a very superior article is produced.

In order to render the process evident, Plate IV. Fig. 1, exhibits a portion of the machinery employed; *a a* is a standard or pillar of cast iron, with a series of antifriction roilers *b b* against which the mould frame *c* moves in a vertical direction; *d* is a furnace shewn in section, with the melting pot *e*, whence the fluid metal is permitted to flow at the lip into the mould *f*; this furnace runs upon an iron rail way *g*, and is brought up to the mould as seen in the figure, by a rack and pinion *h*. The mould *f* consists of two straight bars of cast iron, shewn in a horizontal section at fig. 2, one of the bars being removed in the 1st figure for the purpose of seeing the interior. In each of these bars is a hollow or semi-cylindrical groove, intended to form the external part of the pipe; and in the middle of the mould is placed a straight rod *i i* as a core, which is held in its position by a guide *k*.

The mould is raised and depressed by means of a winch and pinion *l*, which actuates a toothed-wheel and pinion *m*, and the latter taking into the rack *o* at the back of the mould frame, causes the mould to slide up and down by the turning of the winch. The process of casting is commenced when the frame with the mould is at its highest situation, and the pipe is gradually produced as the mould descends. It will be perceived by the cross section of the mould, fig 2., that a wedge-formed channel or opening extends up the front of the mould, through which the metal is intended to run to the interior. A plug is introduced at the bottom of the mould to prevent the metal flowing out, and a stop or face plate *p*, is pressed against the front for the purpose

of preventing the escape of the metal through the wedge formed channel.

Supposing the lower end of the mould to have been raised up as shewn in the figure, within a few inches of the top of the face plate, the furnace is then brought forward as in the figure, and the lip of the melting pot placed close to the face of the mould; the plug being withdrawn, the metal will then run through the channel into the mould; the winch is now turned, and the frame with the mould made to descend slowly, the metal continuing to run into the mould, where it congeals and casts the pipe; the flowing of the metal and the progress of the mould being continued until the upper end of the mould is brought on a level with the top of the face plate, by which means, a length of pipe is produced equal to the length of the mould, whatever that may be.

The guide *k*, that confines the core, is a ferrule fitting the inside of the mould, and through which the core slides; a small arm extending from it passes through the wedge formed channel, and is held by a hook and rod affixed to the standard, or by any other convenient means. This guide is intended to be stationary at a few inches above the flow of the metal, for the purpose of keeping the core in the centre as the mould descends.

The core is a cylindrical rod, extending the whole length of the mould, having one or more small grooves cut along it for the purpose of channels, to conduct off the steam or vapour from the interior of the casting. This rod is to be covered with paper or some other porous substance which will allow the air and steam to pass through, and thereby escape along the grooves of the core.

The stop or face plate *p*, is pressed up against the

mould by weighted levers q, with antifriction rollers at their extremities, part of which are reversed in order to allow the furnace and melting pot to be brought close up to the mould. The weight of these pressing levers may be taken off the face plate when the mould is raised, by lines or chains $r\ r$, which are acted upon by the handle s.

Thus far an apparatus has been described for casting leaden pipes, but the patentee does not confine himself to the casting of these alone; other metallic tubes and rollers, as well as a variety of articles with extended surfaces may be cast upon the same principle in different kinds of metal: viz. by causing the moulds to travel while the melting pot and face plate or stop remains stationary; or the pot containing the fluid metal and the face plate to travel, the mould being stationary. As the apparatus for casting divers kinds of articles must necessarily vary, it is impossible to describe every variety of form which such circumstances may require. It is also in the contemplation of the patentee to employ the same process in casting sheet lead of any thickness which shall not require to be reduced by rolling, and in that case, and under every circumstance where cores are not required, small grooves or channels are to be made in the mould itself, and the surfaces of the mould may be coated with a porous material, by which means the vapour or air will be allowed to pass through the porous material, and escape along the channels in a similar manner and for the same purpose as already described above.

[*Inrolled, October*, 1824.]

To JOHN HOLT IBBETSON, *of Smith Street, Chelsea, in the County of Middlesex, Esq. for his Invention of certain Improvements in the production or manufacture of Gas.*

[Sealed, May 15th, 1824.]

THIS invention has for its object the more complete decomposition of coal in the process of gas making, (viz.) dissolving both the resinous and the carbonaceous part of the coal by the assistance of steam for the purpose of obtaining therefrom carburetted hydrogen gas. The process will be best understood by reference to fig. 3, in Plate IV. which is a vertical section of what the patentee denominates his decomposing apparatus; or as we should say, the retorts and furnace.

In this figure, *a* is an iron frame and door in the back of the brick work leading to the top part of the fire-place; by which aperture the fire is supplied with fuel; in this door is an opening for the admission of air to assist combustion; *b* is an iron frame and door, shewn by dots, at the bottom of the furnace, for the purpose of setting light to the fuel; *c* is the ash-pit. The flues are marked *d d*, the draft passing downwards through the fire; *e* and *f* are the decomposing chambers, in which the coal or other combustible substances are placed for distillation; the door at top of these chambers, by which the coal is introduced, must be closed air tight and luted.

The circular opening *g*, at the bottom of the right-hand decomposing chamber is a pipe to introduce steam, and near the top of the left-hand decomposing chamber there is another pipe *h*, for the same purpose, and at the bottom of the last-mentioned decomposing chamber is a pipe *i*, for the exit of the gas, by which it is conducted from the decomposing apparatus into a suitable receiver. The coal may be withdrawn at the doors shewn by dots, but

these doors must be kept closed and air-tight during the operation of distilling.

The furnace, the flues, and the gratings must be made of such materials as will resist the action of fire. The decomposing chambers *e* and *f*, are to be filled with coke or other carbonaceous matter, which is to be kept red hot by the fire in the furnace during the continuance of the operation; and by thus placing the fire in the midst between the retorts, or decomposing chambers, little heat is lost by radiation.

The steam which enters by the pipe *g*, "circulates through the ignited coke to the top of the chamber, where the results proceeding from this part of the process (i. e. the decomposition of the steam) meet and mingle with the volatile results proceeding from the decomposition of the coals or other matters under distillation, and together pass down through the ignited coke in the chamber on the other side, meeting in their passage with the steam, or with the *nascent* results from the decomposition of the steam admitted at *h*. The solution of the coke will always be in proportion to the quantity of steam passed through it, and the quantity of steam applied must therefore be regulated by the greater or less extent of solution intended. If it be not intended completely to dissolve the coke, then as the coke accumulates, a portion of it must be withdrawn from time to time at the bottom of the decomposing chambers."

By this apparatus coal, and also tar and oil, may be decomposed at the same time; the tar or oil must be admitted into the decomposing chambers by means of tubes passing through the top of the brickwork on the right-hand side, the delivery of which must be regulated by a stop-cock, and never allowed to flow in a greater quantity than will become perfectly decomposed in its progress through the ignited coke.

"The tar and oil will meet in their passage through the ignited coke with the steam, or the nascent results from the decomposition of the steam admitted at *g*, and being themselves thereby decomposed, will rise to the top of the chamber in the state of gas." The coal must be broken into small pieces about the size of walnuts before it is introduced, and recharges must be made from time to time in strata not exceeding an inch and a half in thickness, as the previous deposit gets into a state of red heat.

An apparatus upon the principle here described, may be varied in its construction in several ways, the patentee therefore, does not confine himself to such particular arrangement, but rests his claim upon the following points: 1st. In the employment of steam as an auxiliary in the manufacture of inflammable gas from coal, peat, oil, tar, or other combustible substance. 2ndly. In causing the results which proceed from the decomposed steam, and from the combustible matters "in their *nascent* state, or in the state in which they rise, and before they undergo any process of cooling to pass through ignited coke or other carbonaceous matter," which is also claimed as an auxiliary in the making of gas. 3rdly. In the contrivance by which the coal may be delivered for decomposition at the top, and the coke withdrawn from the bottom to make room for fresh supplies. 4thly. In such a construction of the furnace and flues as will allow the air for the combustion of the fuel to be admitted at the top of the furnace, while the draft of the flues is from the bottom, by which arrangement the smoke is made to pass through the fire and to be consumed. 5thly. In placing the fire within the decomposing chambers, by which means the whole of the heat is made available.

[*Inrolled, November*, 1824.]

To RICHARD EVANS, *of Bread-Street, Cheapside, in the City of London, Wholesale Coffee Dealer, for his new Invented method or process of Roasting or Preparing Coffee, and other Vegetable Substances, with Improvements in the Machinery employed in such Process, and which Machinery being likewise applicable to the Drying, Distillation, and Decomposition of other Mineral, Vegetable and Animal Substances, together with a method of Examining and Regulating the Process whilst such Substances are exposed to the Operations before mentioned.*

[Sealed, 28th February, 1824.]

THE object of the patentee in this improved apparatus for roasting coffee, is to drive off the aqueous parts from the seeds, and to retain the oily parts, the method of doing which will be best understood by reference to the apparatus shewn in Plate V. Fig. 2, represents a vertical section of the roaster, which is a cylindrical vessel revolving over a furnace; *a* is the fire place enclosed within brickwork; *b b* is the cylindrical vesel, made of wrought iron, and intended to contain the coffee; *c* is a hollow tube perforated with holes, upon which the cylinder turns on one side as an axis, and on the other side upon a shoulder, bearing on the brick-work; *d*, is a toothed-wheel upon an axle, that may be actuated by a steam-engine or other power, which wheel takes into a pinion *e*, fixed to the shoulder of the cylinder; *f* is a hood or casing that turns over upon hinges, and encloses the cylinder for the purpose of preventing the escape of heat.

The coffee having been introduced into the cylinder, for the purpose of roasting, and the fuel lighted in the

furnace under it, rotatory motion is given to the cylinder by the agency of a toothed-wheel and pinion *d* and *e*, as above said, by which means the cylinder is made to revolve slowly, and the coffee to be gradually turned over, and equally exposed to the action of the fire. This distribution is, however, further assisted by ledges placed within the cylinder, against which the coffee falls, and is thereby turned over, the oblique ledges conducting it into the middle parts of the cylinder, where the heat of the fire acts most powerfully.

In the early part of the process of roasting, a considerable quantity of steam is envolved, which is permitted to escape through the perforated tube *c*, but when nearly all the aqueous vapours are thrown off from the coffee, the oily parts begin to escape, this it is the object of the patentee to prevent; and for that purpose he then introduces into the perforated tube *c*, another tube without holes, which fits the former closely, and by advancing it a short distance at a time, closes the perforations of the tube *c*, and prevents any further evaporation.

There is some difficulty in ascertaining the precise time at which the evaporation from the coffee ceases to be steam, the patentee therefore employs a piece of slate which when held against the outer end of the tube *c*, shews by the condensation upon its surface, whether the evaporation is merely water, or whether the oily parts have begun to escape, which would produce a thick gummy substance upon the slate; there is no other mode of determining the time at which the perforated tube should be completely closed.

In order to observe the progress of the operation of roasting, and to examine the colour of the coffee, as it goes on, a spoon *g* is introduced through the hollow axle of the cylinder, by which small portions of the coffee

may be drawn out from time to time, and its state exactly known.

When the roasting is deemed sufficient, the cylinder is to be removed from the fire-place, which is to be done by the following contrivance. Near the outer end of the tube *c*, an iron staple *h*, is fixed, which receives an axle that supports the end of the tube; upon this axle, the cylinder is enabled to be raised out of the furnace by lifting the reverse side, it is then turned over and placed with the shoulder, leaning upon the standard *i*, as shewn by dots, where a handle being attached to the square, the cylinder is turned round until the coffee has become nearly cold. It is then to be withdrawn from the cylinder and placed in proper receiving vessels. Another quantity of raw coffee may now be put into the cylinder, and operated upon as above.

By this apparatus or one constructed upon a similar plan, grain of various sorts, such as malt &c., may be dried as well as roasted; it may also be advantageously employed in the decomposition of animal, vegetable, and mineral substances, and for a great variety of other purposes, for which it is claimed.

[*Inrolled, August*, 1824.]

To WILLIAM GUTTERIDGE, *of Dean-street, in the Parish of St. Fin-barrs, in the City of Cork and Kingdom of Ireland, Land Surveyor and Musician, for his Invention of certain Improvements on the Clarionet*

[Sealed, 29th January, 1824.]

THESE improvements apply to the disposition of the keys of the clarionet which are here arranged in a novel

way, and are stated to be conveniently situated for playing certain passages in music, the performance of which were extremely difficult under the old disposition of the keys. The patentee sets forth in his specification many examples of the movements to which his improved keys are particularly adapted; but as our limits will not admit of so extended a report of the inventor's views, we shall confine ourselves to the instrument itself, presuming that its advantages will be seen by those who are expert in the use of that instrument.

Plate IV., fig. 4, exhibits a portion of a clarionet with sixteen keys and two extra levers. This and the following figures are intended to represent the cylindrical part of the instrument spread out in *plano* for the purpose of shewing the relative situations of all the holes and keys. Fig. 4 shews the upper, middle, and lower key-joints; the mouth-piece, the barrel, and the bell parts of the instrument not being represented. The novelties are as follows:—The key marked *a*; the projection from the key *b*, which passes under and acts against the curved termination of the key *c*; the lever of the key *d* passing under the key *e*; the keys *f*, *g*, *h*, and *i*, which are also new; the other keys are only moved a little out of their original situation to make room for the improvements.

Fig. 5 represents the lower key-joint of a clarionet, including the finger-holes for the lower hand; the key *a* is new; the lever *b* is also new; these are both to be played upon by the little finger, the latter passes under and acts against the other keys, as seen. These may be adapted to the upper joint of any clarionet.

Fig. 6 exhibits the middle and lower key-joints of a clarionet; the key *a* is new. These improvements are auxiliaries to the former keys, and are intended to act by cross leverage upon the other key to simplify the fingering,

and bringing out the passages of the music with greater ease, and in a more perfect manner than has been accomplished upon the clarionet by the old disposition of the keys.

[*Inrolled, March,* 1824.]

To ROBERT LLOYD, *of the Strand, in the County of Middlesex, and* JAMES ROWBOTHAM, *of Great Surrey Street, Blackfriars Road, in the County of Surrey, Hat Manufacturers, for their having Invented and brought to Perfection a Hat upon a New Construction, which will be of great Public Utility.*

[Sealed, 19th February, 1824.]

THIS improved hat is intended to fold or slide from its perfect shape into a small compass for the convenience of carrying under the arm in crowded assemblies, or that it may occupy but little room when worn in a carriage, or any other situation where the ordinary bulk of a hat would be inconvenient. The materials of which these hats are to be made are beaver, silk, woollen, or any other substances suitable, or that have been used for hat making heretofore.

Supposing the perfect shape of the hat to be the same as those commonly worn by gentlemen, the patentee's invention is to make the crown fold or slide down, for the purpose of reducing the height of the hat, or to cause the crown to rise and fall, so as to present a high or shallow crown at the pleasure of the wearer.

One part of the crown of the hat is proposed to be folded, or to slide within the other, but in what manner we do not understand, as the specification only states that the middle part is to retire something like a telescope, in

order that the hat may be worn either as a high crown or a low crown, the folding part being taken up out of sight. These hats may be made in one piece as usual, or in several pieces sewed together, and afterwards stretched upon properly-formed blocks.

The moveable crown of these hats is to be supported by wires, whalebones, pieces of wood, or other substance introduced within the hat in the form of a spiral spring, or by cross pieces connected together in diamond-formed joints, like what are called lazy-tongs, or by a contrivance, termed by the patentees a cork-screw joint, or by several small rods upon joints, which are raised to a perpendicular position when the crown of the hat is to be elevated, and turned obliquely when the crown is to be depressed; or by a hoop with several small standards which slide, or by the ordinary manner in which a telescope slides in sockets, to all of which contrivances stops or catches are to be adapted for the purpose of fixing the crown in any desired position. We regret that the specification of this invention will not enable us to give a more intelligible description of the manner in which the patentees intend to adopt these contrivances in effecting the proposed improvement.

[*Inrolled, August,* 1824.]

To John Fussell, *of Mells, in the County of Somerset, Edge Tool Maker, for his Invention of an Improved Method of Heating Woollen Cloth, for the Purpose of giving it a Lustre in Dressing.*

[Sealed, 11th August, 1824.]

This improved method of applying heat to woollen cloth, to improve its dressing, consists in the employment

of steam for that purpose. The mode proposed is, after the cloth has been what might be considered finished by dressing in the gig-mill, or brushing by hand, to roll it tightly upon a roller, having grooves near the edges for the purpose of allowing the lists to sink into those recesses, and thereby permit the cloth to lay perfectly smooth; and then after setting the roll upon its end that the wet might drain off, to submit it to the action of steam, by placing it for about three hours in an open vessel over a boiler, or in a close vessel into which steam is allowed to flow from a generator; or the roller may be made hollow, and the steam pass through it, so as to heat the cloth sufficiently to produce the required lustre, which heat need not be so great as that of boiling water; in which case the rolls should be made to revolve. No precise rule can, however, be given as to the temperature of the steam in which the rolls should be immersed—that must, in general be left to the judgment of the operator; it will much depend upon the colour of the cloth, and the lustre which is required to be raised upon its face.

[*Inrolled, October*, 1824.]

To ROBERT COPLAND, *of Wilmington Square, in the Parish of Clerkenwell, in the County of Middlesex, Gentleman, for his Combination of Apparatus for gaining Power; part of which are Improvements upon a Patent already obtained by him for a new or Improved Method or Methods of gaining Power, by new or Improved Combinations of Apparatus, applicable to various Purposes.*

[Sealed, 16th January, 1823.]

THE design of this invention, appears to be to obtain a perpetual motion by the alternation of several pistons,

actuated by water and air. Plate V. fig. 1, shews a section of the proposed machinery; *a* and *b* are two cylinders open at top, in which the pistons *x* and *y* are to work; the mouths of the cylinders are connected together by the trough *c c*, along which the water flows alternately from one cylinder to the other; *d* and *e* are two cylinders with pistons *v* and *w*, precisely like those last described, and with a trough *f f*, likewise for the passage of the water from one to the other; *g* and *h* are two cylindrical vessels closed air and water tight, but having a communication with each other through the aperture of the slide valve *i*.—*k* and *l* are also two cylindrical vessels similar to those last described, with a communication at bottom through the slide valve *j*.

If the piston *x* be made to rise in the cylinder *a*, it will drive the water from that cylinder along the trough *c*, into the cylinder *b*, the piston *y* descending at the same time, and the air which occupied the cylinder *b* below the piston will be forced through the pipe *m* into the chamber *k*, while the rising of the piston *x* will pump the air from the vessel *l* through the pipe *n*, into the cylinder *a* below the piston; at this time the slide valve *j* being opened (by a contrivance not shewn) the water will be allowed to flow from the vessel *k* into *l*. Precisely the same takes place in the corresponding parts of the machinery, for the rising of the piston *x* will cause the the piston *w* to descend, and the water flowing from the cylinder *d* along the the trough *f*, will occupy the cylinder *e*, while the air expelled from the cylinder *e* will be forced through the pipe *o* into the vessel *h*, and the rising of the piston *x* will pump the air from the vessel *g* through the pipe *p*, at which time the slide valve *i* being opened, the water will flow from the vessel *h* into *g*. The extremities of the rods of the pistons *x* and *y* being

connected by joints to the beam *g*, and of the piston *x* and *w* to the beam *x*, those beams will be made to vibrate, but the action and reaction of the water and air in the several cylinders being balanced, the beams will have acquired no mechanical power, the engine itself having been put in motion only by supposition.

To obtain that power, therefore, which shall actuate the pistons, and give force to the vibrating beams is next to be accomplished, and the means of doing this is by the introduction of hollow plunging boxes *s t u v*. The plunging box *s* is supposed to have been previously filled with water by its immersion in the vessel *g*, and on the water receding from that vessel to have descended by its own gravity; in doing which, its connection to the beam *g* by a rod passing through the shifting boxes would cause that end of the beam to be drawn down with a power equal to the weight of the water in the box *s*, and at the same time the box *t*, from which the water had previously escaped, would by the buoyancy of the air within it rise or float in the vessel *h*, and by means of its rod give an additional impulse or power to lift the beam *g*. Precisely the same is intended to take place in the vessels *k* and *l*, the gravity or levity of the plunging boxes *u* and *v* alternately drawing down and lifting up the ends of the beam *x*, the passage of the air from the boxes *s* to *t*, and from *u* to *v* being permitted by the occasional opening and shutting of stop cock in small pipes leading from one to the other, which is to be effected by rods connected to the beams or otherwise as may be found desirable.

These are the leading principles upon which the patentee proposes to construct his engine, (the parts being capable of several variations in detail,) and which when once set going would, it is presumed, continue to go

without any other aid than its own mechanical force. The fallacy of the hypothesis, must, however, be so extremely obvious, that we presume no farther comment will be necessary. We cannot, however, help noticing, that under an apprehension lest this project should be taken abroad before the patentee had secured an exclusive right to his invention in other countries, or to afford him time to bring his design to maturity here, he has been granted the unprecedented length of time, *fifteen months*, to prepare and enrol his specification.

[*Inrolled, April,* 1824.]

To WILLIAM CLELAND, *of Leadenhall-street, in the City of London, Gentleman, for his invention of certain Improvements in the Process of Manufacturing Sugar from Cane-juice, and in the Refining of Sugar, and other Substances.*

[Sealed, 6th May, 1824.]

THE patentee proposes to run the cane-juice into shallow troughs, or reservoirs, in the bottom of which are a considerable number of circular holes, about an inch and a half, or rather better, in diameter; from each of these holes a long cloth bag is to be suspended, and the liquor be permitted to filter through into a receiver or vessel below, leaving the crystallized part, or sugar, within the bags.

A portion of such a trough is shewn in plate V. at fig. 3, the side of the trough being removed, and the bottom cut through in section vertically. This trough, or reservoir, is to be but a few inches deep, and, if the

juice be introduced in a heated state, a cover should be placed over it, to prevent evaporation. In the bottom of the trough the holes will be perceived, which are to be formed conically, for the purpose of holding the mouths of the bags with the greater security.

The bags are proposed to be of a cylindrical form, and made of that kind of linen called English Duck; they are to be about three inches in diameter, and about six feet long. The mouth part of the bag is to be made of woollen cloth, with a tin or iron ferrule, as shewn at fig. 4. The length of linen, forming the bag, is to be passed through the hole of the trough, and the ferrule at top made to rest in the conical hole, which is secured by the introduction of a nozzle, or funnel-formed piece, fig. 5, and the whole is made fast by the introduction of a bent wire.

The lower ends of the bags being securely tied with a string, the cane-juice is to be poured into the trough, and suffered to filter through the linen, and drop into a suitable receiver placed underneath. Fresh supplies of the juice are from time to time to be poured into the trough, and, after the whole has been thus strained, the receiver, with the drainings, is to be removed, and the lower parts of the bags opened, when the crystallized sugar, contained within the bags, may be taken out, by untying the lower ends of the bags, or by removing them from the trough, and turning them inside out.

[*Inrolled, November,* 1824.]

Original Communications.

ON ROADS, CANALS, AND RAILWAYS.

To the Editor of the London Journal of Arts.

SIR,

PERCEIVING by an extract from the "*Scotsman*" in your last Journal, that the comparative merits of roads, canals, and railways are under your consideration, I have presumed to offer a few remarks on those popular subjects for the consideration of your readers, and indeed, to the public in general, as a wild spirit of speculation appears to be abroad, which to say nothing of the probable advantage, scarcely stops to reflect whether the golden dreams of the enthusiastic projectors are within the compass of possibility.

I do not exactly agree with the writer in the "*Scotsman*" as to the comparative cost of roads, railways, and canals; the expense of constructing a good road will depend principally upon the distance from which suitable materials have to be brought to make it, and next to that upon the undulations of the ground to be passed over, which should be brought as nearly as may be to a level; the expence of a canal will depend first, upon the skill of the land surveyor in selecting the shortest line that can be reduced to one general level, so as to avoid the employment of locks as much as possible: this I am sorry to observe has in some instances been managed in a most unskilful manner. Secondly, upon the property likely to be injured by carrying the canal through it; and thirdly, upon the obstructions to be surmounted, such as the crossing of rivers or tunneling through hills. The expence of a railway is dependent upon many similar con-

siderations, though from the small quantity of ground occupied and the ease with which it is constructed, appear to be of minor consequence to those already mentioned. The shortest line, of course, is to be chosen that can be obtained without any considerable ascent or descent, (the objections to which are noticed in Mr. Palmer's recent pamphlet on Railways;) but next to the skill of the land-surveyor in planning an eligible line, the most material consideration in regard to expence, is the description of rail adopted, several kinds of which are specified in your Journal, (viz.) Birkinshaw's Patent Railway, Vol. II.; Losh's, Vol. III., and Palmer's, Vol. V. beside one or two other recent patents for that purpose not yet reported.

Having said thus much, by way of general considerations to be attended to in any new project of the kind, I proceed to the comparative advantages of roads, canals, and railways, in the conveyance of passengers and goods from one place to another. On the improved condition of our turnpike roads in almost every part of the kingdom little need be said, it is quite obvious that the mode of making roads resorted to by Mr. M'Adam, answers better than any other heretofore adopted, where the situation is exposed to the free action of the sun and air: and the improved construction of stage coaches and vans, afford so much accommodation to travellers, in the expedition of their conveyance, that little remains to be accomplished, or indeed desired upon the public highways.

From the calculations stated in the *Scotsman*, it appears that a horse will draw a load thirty times as great upon a canal as upon a good road; admitting this, it must also be remembered that, from a variety of circumstances, it is utterly impossible that canal navigation

can be conducted with the same expedition as land carriage; and from the inequalities in the level of the country, through which the canal passes, it necessarily follows that the rout must be circuitous: canals, therefore, are only suited to the conveyance of bulky and heavy merchandize, not to ordinary travelling, or the transportation of light goods. It is stated by the same calculator, that a horse will draw a load ten times as great upon a railway as upon a good road of gravel or stone, still, however, the same objection exists on the score of expedition. Rail-ways and their carriages are not calculated for rapidity of movement, the smallest obstruction would throw a carriage off the rail, if it went with any considerable velocity, and the rails themselves, as at present laid, would fly up, or break, by any lateral pressure, or strain from the rapidly revolving wheels; to render iron rails, therefore, sufficiently strong and stable in their foundations to support carriages that should travel rapidly, would increase their present cost, at the least calculation, four or five fold.

It is, therefore, obvious that upon the score of celerity there is scarcely any preference between towing a barge upon a canal, and drawing a carriage upon a rail-way. The original cost of the canal may be ten times that of a rail-way (which is perhaps a fair general average); but the expense of horse's labour in towing the barge being only one-tenth that of drawing a carriage upon a railway, brings the two modes of conveyance to nearly the same point of costs, and of course to the same profit to the proprietors.

But the projectors of the proposed new railways are amusing the speculators with the idea of STEAM-CARRIAGES and LOCOMOTIVE ENGINES, by which we are to be conveyed, upon their lines of new road, from one part of

the kingdom to another, at the rate of from ten to twenty miles per hour. Before I discuss the practicability of such extraordinary celerity, with which the public are to be transported, perhaps it would be prudent to inquire—where are these steam-carriages? there have been many projected, are there any before the public? is there a single instance of any coach, van, waggon, or other vehicle, having been propelled by means of steam in any part of the kingdom?

There are certainly in the neighbourhood of Leeds, and also of Newcastle, some locomotive engines, employed drawing coals, the former upon Blinkinsop's principle, with cogged wheels, running in a toothed rail, the latter upon the plan of Stevenson, certainly more simple. That near Leeds travels a distance of nearly three miles in about an hour and a half, drawing twenty waggons loaded with coals, and, from the report of most respectable engineers in its neighbourhood, I understand that the expence of the conveyance is scarcely less than it would cost if horses were employed. Stevenson's locomotive engines have the advantage both in simplicity and speed, but the greatest velocity at which these can be driven is three miles and a quarter per hour.

I may be told, perhaps, that there are Perkins's steam-carriages, M'Curdy's, Brown's, James's, Gordon's, and several others, which have made some noise in the world forthcoming; yes, but these are all in embryo; and, if I am to judge from the past, I should form no very favourable anticipation for the future. Steam-carriages certainly do not at present exist, and though they are not exactly in the same position in principle as perpetual motion, yet, from the many difficulties to be overcome in the construction of such machines, and the great inconveniences attendant upon their employment if accom-

plished, there is not a reasonable ground for expecting that a carriage propelled by steam will, at least in the present state of science, be made available for the ordinary purposes of travelling. This, perhaps, is not generally known; for amidst such a chaos of vaunting speculative wonders as the periodical press daily teems with, an ordinary reader is bewildered, and takes, upon the credit of every editor the story to be true, because he finds it in print.

I am, Sir,

Yours, &c.

CAUTION.

To the Editor of the London Journal of Arts, &c.

SIR,

ARTS and Sciences recognise no distinctions between nations, they belong to the community at large. Our *Society for the Encouragement of National Industry* being an institution deserving the attention of British emulation, I herewith address to you a list of premiums proposed for discoveries or inventions in the useful arts, hoping that among the readers of your widely-circulated Journal, some may be induced to become candidates, by offering us their plans for the accomplishment of the objects proposed. Founded, as this society is, upon the principle of promoting universal knowledge, I think it but just that British artists should be enabled to partake of the benefits which are by this society proposed to the world at large.

I am, Sir,

Yours, &c.

CHARLES ALBERT.

Paris, January 17, 1825.

Prices proposed by the Society for the Encouragement of National Industry, Paris. 1825-26-27 and 30.

MECHANICS.—1825.

	Francs.
Cheap and proper machinery for extracting juice from beetroot.	2,700
The manufacturing of steel wire for needles.	6,000
The manufacturing of needles.	3,000
The manufacturing of a machine to make glasses for optics.	2,500
A hand mill to peel dry vegetables.	1,000
The application of the hydraulic press to the extraction of oil, wine, and fruits	2,000
A machine to shave skins for hat manufacturing.	1,000

CHEMISTRY.

The preparation of flax and hemp without steeping in water.	6,000
The discovery of a substitute for the colour called "outremer."	6,000
An improvement of dying hats.	2,000
An improvement in manufacturing cat-gut for instruments of music.	2,000
The manufacture of paper from mulberry-tree bark.	3,000
The manufacturing of large founder's-crucibles.	2,000
Improvements in casting of iron	6,000
Ditto in moulding of small castings.	6,000
Wool hat manufacturing and it's cheapness	600
A new process of tinning looking-glass, different to the known one	2,400
Improvements in the materials employed for engraving.	1,500

	Francs.
Discovery of a metal less oxydable than iron and steel, to be employed in machinery for dividing substances of food	3,000
DOMESTIC ECONOMY.	
For construction of economical stoves	4,000
For drying or desiccation of meats or animal flesh	5,000
For manufacturing of isinglass	2,000
For a material to be moulded like plaster, and resist the atmosphere	2,000
AGRICULTURE.	
A mill to cleanse buck-wheat	600
For a plantation of pine trees—" Larricio"	1,000
——— Ditto of Scotch pines—" pinus rubra'	500
The introduction of artesian wells, where they do not exist	1,500
The introduction into France, of plants useful to agriculture and manufacture	2,000 1,000
DOMESTIC ECONOMY.—1826.	
An economical discovery to make ice	2,000
AGRICULTURE.—1827.	
For a description in the most useful sorts of manufactures to be exercised by country people and in country places.	3,000 1,500
1830.	
For plantations in land of an inclined situation.	3,000
For a memorial on the effects of chalk or lime, used as manure	1,500

To be delivered on the 1st of May, in 1825-26-27, and 1830.

Engines, of cheap purchase, easy carriage and manœuvre, are still wanted in our villages. Should there

be in England any improvement in these engines, some advantageous proposals might be made to the French Government.

METEOROLOGY.

To the Editor of the London Journal of Arts, &c.

SIR,

IT may be interesting to the readers of the Meteorological Journal to know the abundant quantity of rain which has fallen during the past year, a better idea of which cannot perhaps be had, than by comparing the mean of the past seven years, with the quantity fallen during the year 1824; thus: the mean for the last seven years is found to be 22.76375 inches, and the rain fallen during the past year is 32,74 inches, an excess of nearly ten inches.

CHARLES H. ADAMS.

Lower Edmonton.

To the Editor of the London Journal of Arts.

SIR,

ALLOW me to state, for the information of such of your readers as are fond of comparing Meteorological Observations, that the mercury in my barometer rose to the extraordinary height of thirty-one inches on the 9th of January, and remained at that elevation the whole of the following day, when it gradually began to fall.

The thermometer in the shade was, on the 9th, at 42° Fah., and on the 10th at 41°.

I have not observed such an extraordinary rise in the

barometer since the 11th of February, 1821, when at 11 *p. m.* it attained the same altitude.

Your's, &c.

J. LEWTHWAITE.

Rotherhithe, Jan. 25th, 1825.

P.S. I have said the mercury stood at 31 inches—it, in fact, was $\frac{1}{10}$ of an inch higher. The noneus not moving above the 31, I was unable to measure the excess. My barometer is one on the best construction, and furnished with a gauge, by which means the mercury in the cistern is always kept at the same point.

Novel Inventions.

New Auger.

A NEW constructed auger has been lately invented by Dr. Church of Birmingham, for which he has obtained a patent; we shall therefore particularly describe its form and the mode of making when the specification is inrolled; but we cannot avoid mentioning in this place its extraordinary merits, which so much exceed every other kind of auger or boring tool that we are acquainted with, that we should certainly not have given full credit to a report, had not our own hands and eyes been the means of communicating the facts to our senses.

This improved auger, (indeed we have seen several of them of different sizes, but the most perfect one we now refer to,) is one inch and one-eighth in diameter. We first tried its effects upon a piece of dry deal four inches thick, held in the left hand without any other support, and turning the auger by the right hand in the way that gimblets

are usually turned, passed the auger through the four inch deal in fifty seconds. With the assistance of a bow, it was made to penetrate through a post of seven inches square in twenty-one seconds; and in the hand of an expert workman, there is no doubt but that its progress would be much more rapid. It cuts a perfectly smooth hole, and clears itself as it advances.

The utility of an auger possessing such superior advantages to shipwrights as well as a variety of other artizans, must be immediately obvious, and one circumstance which renders it still more valuable is, that its form is such that it can be sharpened from time to time upon an ordinary grindstone, without in the slightest degree altering its figure; indeed it will retain the same form and properties even though ground down to within a short distance of the stem.

Not having the inventor's permission, we refrain from publishing a particular description of this instrument; but as soon as the specification is enrolled, which will be in May, we propose to ourselves the pleasure of presenting it to our readers in a more perfect state.

Teaching the Blind to Write.

Our correspondent at Paris writes thus:—"A method of teaching the unfortunate blind to write, and consequently to read what they have written, is proposed to our government. The ingenious author (and I agree with him) thinks that humanity having its principal seat in Great Britain, a timely communication of this important discovery, made to the enlightened administrators of your government, would meet with their patronage, and afford him, besides his own inward satisfaction, a small retribution for his labour. You, doubtless, share our opinion in behalf of your country, and I feel pleasure in being the author's interpreter."

We have not, as in France, a *Consultive Board* appointed by government to investigate and reward the merits of ingenious projectors. Our *Society of Arts* take upon them that pleasing task, and we therefore refer the inventor to that Society, where its merits will be fully appreciated, and a suitable reward adjudged.—ED.

Polytechnic and Scientific Intelligence.

Royal Society.

January 13.—John Bell and Wm. Scoresby, Esqrs. were admitted Fellows, and a paper, by Captain Henry Kater, giving a description of a floating collimator, was read.

The use of the collimator is for determining the line of collimation of the telescope of a divided instrument. This is usually done by means of a level or plumb-line, or from observations taken by reflection, compared with others made by direct vision.

Having pointed out the inconveniences of all these methods, the author proceeds to a description of his instrument, which consists of a cast-iron plate, eight inches long, four inches broad, and from a quarter to half of an inch thick; from the upper side of the iron plate proceed two pieces, to which is fixed, parallel or perpendicular to the plate, a small telescope, which, for the sake of distinction, he calls the collimating telescope. The instrument thus prepared is floated on mercury in a wooden box, a little larger than just sufficient to receive it, and, in order to keep it in the middle, there are two

pins projecting from the plate, which move freely in two metal grooves, let into the opposite sides of the box.

The principles upon which this instrument depends will be easily understood if we only consider, first, that floating bodies always preserve the same position in respect to the horizon; and, secondly, that the wires of a telescope, when accurately adjusted to its *ultimate focus*, may be distinctly seen through the object glass, appearing under these circumstances, in every respect, as though they were removed to an indefinite distance from it.

When the telescope is so placed as to be perpendicular to the surface of the mercury, the author calls the instrument a vertical collimator, when parallel to it, a horizontal one.

The method of using the vertical collimator is this; having brought its telescope, and the telescope to be adjusted, as nearly as possible into the same straight line; look through the former, and with its wires bisect the wires of the latter, and read off. Then turn the collimator half round in azimuth, bisect its wires as before, and read off again, and if the readings be the same in both positions, the telescope is adjusted to the *nadir*, but if not, half the difference will be the error of the line of collimation. The adjustment by a horizontal collimator is performed in the same way, with this exception only, that instead of turning the round in azimuth it must be removed to the opposite side of the room.

The author then gives an account of some experimental trials, made by him for the purpose of ascertaining the degree of accuracy which might be attained by means of this instrument, and, from their results, concludes, that it may be safely depended upon to less than one second of space. He also suggests, that by giving different

degrees of inclination to the telescope, it might, perhaps, be successfully employed for examining the divisions of a circle.

July 20.—Capt. F. W. Beechey, R.N. was admitted, and Capt. James Mangles, R. N. was elected a fellow of the Society, and a paper on the construction of barometers, by John F. Daniell, Esq., was read.

Mr. Daniell commences by endeavouring to shew that a careful examination of different barometers, particularly that lately made under his direction by Mr. Newman, for the Royal Society, that the air will insinuate itself between the mercury and the glass, and gradually find its way into the upper part of the barometer tube. This he attributes to the very feeble affinity which mercury has for glass, and, as a proof, instances the well-known fact, that gases are more effectually confined under receivers immersed into water, than under those immersed in mercury. As a remedy for this evil, he proposes to affix by fusion, or by some other equally effected means, a rim of platinum to the open end of the barometer tube; and has no doubt, from the strong affinity which these metals have for each other, and the trials which he has made of them, that it will be found an effectual mean of preventing the passage of air into the tube, and consequently of preserving the barometer from deterioration.

January 27.—The Rev. George Fisher was elected a fellow, and part of a paper read on the Anatomy of the male Cricket, by Dr. John Kidd.

Astronomical Society.

At the Meeting, this evening, Mr. Bailey laid on the table, for the inspection of the Members, two Micrometers,

which have been recently invented and constructed by M. Frauenhofer, of Munich.

These micrometers are formed by means of very fine lines cut on glass, with a diamond point in a peculiar manner, and placed in the focus of the telescope. One of these micrometers consists of concentric circular lines drawn at unequal distances, and the other consists of straight lines crossing at a given angle. The mode of cutting these lines has furnished M. Frauenhofer with a method of illuminating them, which (at the same time that it renders the lines visible) leaves the other part of the field of the telescope in darkness; so that the transits of the smallest stars may be observed by means of these micrometers: the lines appearing like so many silver threads suspended in the heavens. A short account of the circumstances, which led M. Frauenhofer to this happy invention, was read.

An engraving of Frauenhofer's Astromatic Telescope, at Darport, of fourteen feet focus, by nine inches aperture, was also submitted to the Members present by Mr. Herschel.

A communication was read from Captain Ross, dated Stranraer, 7th August, 1824, in which he transmits a Diagram exhibiting his observation of the occultation of Herschel's Planet by the Moon, on the preceding day, with Ramage's 25 feet telescope, and a power of 500.

The Planet appeared to have entered about one-third of its diameter on the dark part of the Moon before it disappeared, and its light began to diminish before it touched the lunar disc. On the contrary, at its emersion, it appeared one-fourth of its own diameter distant from the Moon's western limb. The whole time of the occultation was $1^h. 7^m. 44^s. 5$.

After this, the reading was commenced of a paper by

Mr. Henry Atkinson, of Newcastle-upon-Tyne, "On Astronomical and other refractions, with a connected enquiry into the law of temperature in different latitudes and altitudes." As the reading of this paper will be resumed at a subsequent meeting, an abstract of the whole may, with propriety, be deferred.

Linnæan Society.

Dec. 7.—W. G. Maton, M.D., vice-president, in the chair.

Mr. Sowerby exhibited some specimens of Beryl from the mountains of Morne in the county of Down. The reading of the Third Part of Dr. Hamilton's Commentary on the *Hortus Malabaricus* was continued. Among the plants which were the subject of investigation were the following: *Codda Panna, Niti Panna, Todda Panna, Katou Indel, Tsjaka Maram, Ata Maram, Anona Maram, Ansjeli, Kato Tsjaka,* &c.

Dec. 21.—A letter from Mr. Youell was read, stating that *Ardea cayanensis* had been taken near Yarmouth: also a fine specimen of the Green Ibis of Latham, and which had been deposited in the Norwich Museum. Mr. Y. also corrects some erroneous statements of Mr. Bewick respecting the *Fulica atra.*

Read also an account, by the Rev. W. Kirby, of a remarkable Fungus, which he names *Atractus*, and places between *Clathrus* and *Phallus:* and a Description of such Genera and Species of Insects, alluded to in the "Introduction to Entomology" of Kirby and Spence, as appear not to have been before sufficiently noticed and described: by the Rev. W. Kirby.

Geological Society.

Dec. 3.—A notice was read, "On some Fossils found in the Island of Madeira;" by the late T. E. Bowdich, Esq.

In this notice, the author describes a formation of branched cylindrical tubes incased with agglutinated sand, which occur in great abundance near Fanical, fifteen miles from Funchal, in the Island of Madeira. Mr. Bowdich is inclined to refer these to a vegetable origin. They are accompanied by shells, some decidedly terrestrial, and others which appear to belong to a marine genus. In conclusion, some account is given of the general features and structure of the neighbouring district.

An extract of a paper was then read, entitled "An Inquiry into the Chemical Composition of those Minerals which belong to the genus Tourmaline;" by Dr. C. G. Gmelin, Professor of Chemistry in the University of Tubingen, and For. Mem. G. S.

Professor Gmelin, in this memoir, details at length, the various analyses of minerals of the Tourmaline family which have been made by former chemists. He then describes the methods which he adopted in his own experiments, and adds the results which he obtained from them.

The author divides the different species of Tourmaline into the following sections: 1st, Tourmalines which contain lithion: 2d, Tourmalines which contain potash or soda, or both these alkalies together without lithion and without a considerable quantity of magnesia; 3rd, Tourmalines which contain a considerable quantity of magnesia, together with some potash, or potash and soda.

"It appears," he says, in conclusion, "that when we compare the analyses of the different species of Tourmalines, the most essential ingredients are boracic acid, silica, and alumine, whose relative quantities do not vary much. It appears further, that any alkaline substance, though in no considerable quantity, may be likewise an essential ingredient. The different nature of these alkaline substances may be employed by the chemist, as we have used it, to divide these minerals into different sections. But it will appear to be quite useless to attempt to give mineralogical formulæ for the chemical composition of these minerals, when it is considered; 1st, that we can by no means rely upon the correctness of any statement regarding the quantity of oxygen in boracic acid; 2dly, that the quantity of alkaline bases, whose oxygen would be unity, is so small, that it cannot be determined (with sufficient accuracy) without great errors in the computation of the relative quantity of oxygen in the other ingredients; 3dly, that in one species no account could be given of a considerable loss of weight. He has, however, calculated the quantities of oxygen in every species, with the intention of comparing the sum of the oxygen contained in the bases, with the sum of that contained in the acids, viz. boracic acid and silica. The result of this calculation is then fully stated.

Wernerian Natural History Society.

November 13*th*.—There was read a notice by Major-General Hardwick, of the Incarceration of a live toad in a well at Fort William barracks, Calcutta, for 54 years. The evidence relative to the actual incarceration of the toad, and its total exclusion from the external world, seemed to be quite imperfect.

The preface of a paper by Mr. George Don, was read, on the monocotyledonous and acotyledonous plants, found between the 4th and 11th degrees of north latitude on the west coast of Africa.

There was read, an account of a viviparous variety of *Juncus Lampocarpus* by Mr. PARRY. It was doubted whether this was a new variety of the plant alluded to, and even whether this was the name of the specimen submitted to the Society. The occurrence of the viviparous varieties among similar plants was said to be by no means unusual.

December 5.—There was read notices regarding the Blair Drummond fossil whale, by H. HUME DRUMMOND, Esq. and Mr. BLACKADDER.

The President, R. K. GREVILLE, Esq. requested Dr. Knox to ascertain, as far as the specimens admitted, to what species of the cetacea the bones now presented to the Society belonged; and to give in a notice on that subject at a future meeting.

Society for promoting the Useful Arts in Scotland.

December 7.—There was read, the Description of the first Steam-engine, invented by the Marquis of Worcester.

The following papers were also laid before the Society, to be read in their order at the next meeting on the 21st of December.

1. Description of the original Machine for Drying Linen by Steam, invented by the late Mr. James Watt. The Drawing and Description by Mr. WATT.

2. Description of the new Fangate Sluice, invented and erected on the Steinenboch canal, by M. BLANKEN of Amsterdam.

3. Description of several new Sluices, by THOM of Rothsay.

4. Description of an instrument called a Trigon, for solving promblems in Navigation, by Mr. Burnett, Dunse.

The following Instruments were exhibited at the Meeting:—

1. Mr. Burnett's Trigon.
2. Files manufactured by M. Raoul of Paris.
3. Specimens of Curves described by Mr. Jopling's Machine.

Abstracted Report of the Select Committee of the House of Commons, on the Exportation of Machinery and Artizans. [Continued from page 51.]

Mr. Alexander Galloway, further examined.

When a machine is sold to a foreigner, and it is necessary to send a workman abroad to put it up, the master subjects himself to the penalty against enticing citizens out of the country, and indeed if it was known that a man was going to set up a steam-engine, he would certainly be stopped; orders are always given with the express conditions that the engine will not be paid for until put in action by the maker. Mr. Martinue, had stated his opinion to be different upon the meaning of this point of the law, but Mr. G. considered it conclusive.

An order was undertaken by Mr. G., some time back, with the permission of Government, for a small mint, and a variety of other machines, to be sent to Algiers; it would have been hazardous to have undertaken this order without such permission. A similar permission has been granted to Mr. G., to send a large press to Egypt, that

is "in plain English permission to offend the law." Perhaps in setting up such machinery abroad as is allowed to be exported men could not be legally stopped; but Mr. G. has always thought it prudent to be secret as to whom he intended to send, when they were going, and to what place. The same difficulty has occurred in sending men to our own colonies, and very great trouble has sometimes been given at the Custom House upon those occasions.

The law prohibiting artizans from going abroad to execute their calling is totally ineffectual, for they are constantly enticed away both by foreigners and Englishmen residing abroad. There are many ways of seducing the men, by waiting in the neighbourhood until they quit the manufactories at meal times, or at night, and then obtaining a knowledge of such as are wanted. When Mr. G. returned last from France he found that six or eight of his men had been enticed away in his absence.

The law is merely vexatious, it does not prevent their going abroad, as they go under a variety of excuses, and pass unless previous information has been lodged against them. There is considerable difficulty in their going to North America, because they undergo examination at the searcher's office at Gravesend, and a captain is under a penalty of £200 if he takes any man who has not been examined; but an engineer may call himself a farmer, and so evade the law. The best workmen are generally taken, which is productive of the greatest inconvenience to the master: if the law was repealed, Mr. G. thinks the best hands would not be so likely to leave the country, as they were formerly; for none would quit without very greatly increased salaries, and the French do not now stand in need of directors as they did some years back.

The comparative rates of wages between the native workmen in France, and in England is in the proportion of about *twenty-two or thirty-six*; that is, twenty-two shillings per week would be paid to a French workmen of equal merit to one that in England earns thirty-six shillings, the wages being higher here; yet an English workman in France, would receive two guineas or about double the pay of a native. Some difference may exist in the price of provisions in the two countries, but they would reap no advantage if they indulge in English habits. Mr. G. knows but very few men who have been to France and returned, most have been afraid to come back, and if they have, they generally kept their own counsel. Many of the men who are in France, would gladly return if they could with safety. The want of a passport is not the prohibition; one acquainted with French habits, may by some management contrive to travel without a passport, by getting down from the carriage and walking through the fortified towns. There is no difficulty in Englishmen quitting France, but considerable impediments to their entering it. Mr. G. believes, that were the men at perfect liberty to go if they thought proper, they would not feel an inclination to exercise the right, the mere circumstance of restriction sits uncomfortable upon restless minds, and they feel an irresistible wish to break through laws, the removal of which would present no charms, and would banish the desire of indulgence.

Many men have quitted England under a promise of four or five guineas per week, but when they had been employed a short time, and indeed had instructed their masters, their wages have been reduced to two guineas, or less; the men have been obliged to submit to these breaches of faith, from the difficulty and danger of returning.

Mr. G. is perfectly satisfied, that if all restrictions were removed, there would hardly be an instance of a workman leaving his country, nor is he afraid of the mechanical exertions of any country while we have scope for our talent and industry. If the men who have quitted England have not found themselves worse off in France, at least they have been disappointed in their anticipations. Should the laws be repealed there is little doubt but that the most valuable men would return; valuable not only for their knowledge and experience, but for their example towards the rest.

Artizans are but little disposed to emigrate if they have the means of ordinary comforts at home. None of Mr. G.'s men would agree to go abroad to set up machinery, without a considerable increase in their wages, and other favourable inducements. The character, conduct, and knowledge, of artizans are considerably improved within the last thirty years. In the way in which Mr. G. conducts his business, men are of little use to him unless they can read and write, and, by strictness in point of character and behaviour, as much decorum and good order is to be seen in Mr. G.'s manufactory as will be found in the better classes of Society. A strong desire is now felt, among working mechanics, for the acquirement of scientific knowledge, to forward them in their labour. Mr. G. here presented to the Committee a copy of the rules which regulate his manufactory, and considered that their spirit and manner would clearly show the correctness of what he had stated.

There has been, since the establishment of the *Saving Banks*, a greater desire, on the part of the working classes, to economise, and they certainly have improved generally in their conduct—dress better—are less given to intoxication; they are decidedly better men. Some have

deposited money in the saving-banks; they are more frugal and prudent than they used to be; the regulations introduced, which are the joint production of Mr. G., and his men, have formed a bond of union to which every one subscribed on entering his employ.

On being asked how many men he employed in his manufactory? Mr. G. replied, about eighty. There are, at the present time, in almost every manufactory of any extent, regulations for the good order of the men, but in many there is still much of the thraldom and bad management that existed thirty or forty years ago. That, however, is rapidly passing away, and no doubt will soon be wholly dissipated, when the men will be governed by their attachments and understandings, rather than by their fears and prejudices: mechanics and engineers are particularly alluded to. It was asked whether any of Mr. G.'s workmen received parochial aid? to which he replied—not one; they would consider it the greatest indignity that could be offered them while in health and employment; besides, that it is unnecessary, there being a fund provided for illness, which furnishes them under every vicissitude, and in the most independent, as well as economising way; every workman pays sixpence per week out of his wages, and, if sick, is entitled to one pound per week. The labourers pay three pence per week, and, when ill, receive ten shillings. These sums have been found sufficient; and, at Christmas, if the fund exceeds a certain sum, the surplus is divided. This private benefit society is found so desirable, that men prefer Mr. G.'s shop to others. Instead of spending the fines incurred for improper conduct, they are put into the fund. Similar regulations exist in other manufactories where great numbers are employed.

Mr. G. does not know what it has cost foreigners to get artizans from London to Paris. It has been always considered to be hazardous, and therefore a circuitous route is generally taken; it has cost forty or fifty pounds, as a premium; to get men to Paris, and in some instances one hundred pounds has been laid down for each man before they could be prevailed on to start; they are perfectly aware of the penalties attendant upon going abroad. An Englishman in Paris would not now get more than ten or fifteen per cent. more than in London, unless previously engaged.

New Patents Sealed, 1824.

To James Deykin, and William Henry Deykin, of Birmingham, in the county of Warwick, button makers, for their new invented improvement in the manufacture of certain military, naval and other uniform and livery buttons.—Sealed 23rd December.—2 months.

To Daniel Stafford, of Liverpool, in the county Palatine of Lancashire, gentleman, for his invention of certain improvements on carriages.—Sealed 24th December.—6 months.

To Samuel Denison of Leeds, in the county of York, whitesmith, and John Harris, of Leeds, aforesaid, paper mould maker, for their invention of certain improvements in machinery, for the purpose of making wove and laid paper.—Sealed 1st January.—6 months.

To John Heathcoat, of Tiverton, in the county of Devon, lace manufacturer, for his invention of certain

improvements in machinery, for making lace net, commonly called bobbin net.—Sealed 1st January.—6 months.

To Pierre Erard, of Great Marlborough Street, in the county of Middlesex, musical instrument maker, in consequence of communications made to him by a certain foreigner, residing abroad, for an invention of certain improvements on pianofortes.—Sealed 5th January.—6 months.

To Alexander Tilloch, of Islington, in the county of Middlesex, Doctor of Laws, for his invention or discovery of an improvement in the steam-engine, or in the apparatus connected therewith, and also applicable to other useful purposes.—Sealed 11th of January.—6 months.

To William Henson, and William Jackson, both of Worcester, Lace manufacturers, for their invention of improvements in machinery, for making lace or net, commonly called bobbin net.—Sealed 11th of January.—6 months.

To Goldsworthy Gurney, of Argyle Street, Hanover Square, in the county of Middlesex, surgeon, for his invention of an improved finger keyed musical instrument, in the use of which a performer is enabled to hold or prolong the notes and to increase or modify the tone at pleasure.—Sealed 11th January.—6 months.

To Francis Gybbon Spilsbury, of Leek, in the county of Stafford, silk manufacturer, for his invention of certain improvements in weaving.—Sealed 11th January.—6 months.

To William Hirst, of Leeds, in the county of York, cloth manufacturer, for his invention of certain improvements in spinning and slubbing machines.—Sealed 11th January.—6 months.

To John Frederick Smith, of Dunston Hall, in the parish of Chesterfield, in the county of Derby, Esq., for his invention of certain improvements in the preparation, or manufacture of sliver, or slivers, or tops, from wool, or wool and cotton or other suitable fibrous materials.—Sealed 11th January.—6 months.

To John Frederick Smith, of Dunston Hall, Chesterfield in the county of Derby, Esq., for his invention of certain improvements in dressing and finishing woollen cloths.—Sealed 11th January.—6 months.

To Joseph Locket the elder, of Manchester, in the county of Lancaster, engraver to calico, and other printers, and copper roller manufacturer, for his invention of certain improvements in producing or manufacturing a neb, or slob in the roller, shell or cylinder made of copper or other metal, used in the printing of calico, muslin, cotton, or linen cloths.—Sealed 14th January.—2 months.

To James Falconer Atlee, of Marchwood, in the county of Southampton, gentleman, for his new invented process, by which planks and other scantlings of wood of every description will be prevented from shrinking, and will be altered and materially improved in their durability, closeness of grain and power of resisting moisture, so as to render the same better adapted for ship building and other building purposes; for the construction of furniture and other purposes, where close or compact wood is desirable, in so much that the wood so prepared will become a new article of commerce and manufacture, which he intends calling "*condensed wood.*"—Sealed 11th January.—6 months.

To George Sayner, of Hunslett, in the parish of Leeds, in the county of York, Dyer, and John Greenwood, of

Gomersall, in the said county, machine maker, for his invention of certain improvements in the mode or manner of sawing or cutting wood and timber, by machinery.—Sealed 11th January.—6 months.

To Thomas Magrath, of Dublin, for his new invented composition to preserve animal and vegetable substances—Sealed 11th of January—6 months.

To Thomas Magrath of Dublin, for his new invented and improved apparatus for conducting and containing water and other fluids, and preserving the same from the effects of frost.—Sealed 11th of January—6 months.

To John Phipps of Upper Thames-street, in the city of London, stationer, and Christopher Phipps, in the Parish of River, in the county of Kent, paper maker, for their invention of an improvement or improvements in machinery for making paper.—Sealed 11th January—6 months.

To William Shelton Burnett, of London-street, in the city of London, merchant, for his invention of a new method of lessening the drift of ships at sea, and better protecting them in gales of wind.—Sealed 11th January—6 months,

To Jonathan Andrew, Gilbert Tarlton, and Joseph Shepley, all of Crumpsale, near Manchester, in the county of Lancaster, cotton spinners, for their invention of certain improvements in the construction of a machine used for throstle and water spinning of thread or yarn, whether the said thread or yarn be fabricated from cotton, flax, silk, wool, or any other fibrous substance or mixture of substances whatsoever, which said improved machine is so constructed to perform the operations of sizing and twisting in, or otherwise removing the superfluous fibres from the said thread or yarn, and is also applicable to the purpose of preparing a roving for the same.—Sealed 11th of January—6 months.

LITERARY NOTICES.

PETERSBURG.—The Academy has just published, in six volumes, its grand Dictionary of the Russian Language; this production appears to have been much wanted, as no work of any magnitude of the kind existed prior to its publication.

ANCIENT CHRONICLES OF THE NORTH: —A series of ancient chronicles are about to be translated from ancient MSS. deposited in the Royal Library of Copenhagen; they are written in the Icelandic language, and are expected to throw considerable light upon the obscure history of the northern regions. The intended publication will be in three different languages—the original Icelandic, the Danish, and the Latin.

SCULPTURE.—A young Roman sculptor, of the name of Finchetti, who is said to possess great originality of style, has lately produced a work, "Venus leaving the Shell," which has been highly eulogized by those conversant in this beautiful art.

A Journal of a Residence and Travels in Colombia, during the years 1823 and 1824, by Capt. Charles Stuart Cochrane, of the Royal Navy, is just ready for publication; it will be illustrated by a map and coloured plates.

In the press, to appear in the course of a few days, in 2 vols. 8vo. Travels in South America, during the years 1819, 20, and 21, by Alexander Caldcleugh, Esq. The work is to be embellished with a map and engraving.

Mr. Frederick Joyce, the Operative Chemist, has in the press, in one small volume, with plates, a work on Chemical Mineralogy.

VIEWS OF LONDON.—The first part of an interesting work, under the above title, has just appeared. The plates are engraved by Heath, from drawings by W. Westall, Mackenzie, and others. The subjects of this part are London Bridge, the New Custom House, Waterloo Bridge, and London from Richmond Hill. The views are accompanied with brief descriptions. It is rather singular, that we scarcely ever find topographical works of any merit aided by the meritorious exhibitions of art; and as seldom do we find works of art accompanied by anything more than a descriptive catalogue.

An amusing and well-written pamphlet has been forwarded to us, entitled "Remarks on the different Systems of Warming and Ventilating Buildings," addressed to the Economist, the Invalid, the Desirer of Safety, and the Lover of Comfort, with reference more particularly to an improved and simple Calorific Apparatus, by G. P. Boyce. We cannot deny the correctness of Mr. B's. reasoning, that enclosed fireplaces are more safe than open ones, and that a regularly warmed atmosphere is more condusive to health than the variable temperature of a room heated by our open stoves; but habit is second nature, and it will certainly be rather an extraordinary achievement to remove, by argument, that national hereditary love which we most of us feel for an "English Fire-side."

Illustrations of the Royal Palace of Brighton, by John Nash, Esq., by command of his Majesty, are announced for early publication; they are to consist of Picturesque Views, in colours, of the entire Building and Principal Offices, taken from the Gardens: also of the Chief Apartments as completed, with their Furniture and Decorations. The number of copies are to be limited to 250.

NORTHERN EXPEDITION.——A New Brunswick Paper of the 16th December says, "The Discovery Ships were among the ice near Cape Chidley, Hudson's Straits, about the 3d of August last: they were about 1200 miles from Repulse Bay, where it was their intention to winter."

In the cabinet of drawings at Munich, there has been found it is stated, a production equally remarkable as a drawing and a manuscript; from a memorandum on the back the following particulars are obtained.—This is the original drawing of Benvenu to Cellini designed by him, and presented to the Academy of Painting at Florence, for the seal of this Academy, with the explanation in his own handwriting.

George Waddington, Esq. the author of Travels in Ethiopia, has a volume in octavo, nearly ready for publication, under the title of a Visit to Greece, which will contain various facts respecting the Revolution, from collections made in that country.

LONDON:
SHACKELL AND ARROWSMITH, JOHNSON'S-COURT, FLEET-STREET.

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No. LI.

Recent Patents.

To John Finlayson, *of Muirkirk, in the County of Ayr, Farmer, for his Invention of certain Improvements on Ploughs and Harrows.**

[Sealed 15th January, 1824.]

These improvements apply to iron ploughs, and are defined under six heads—the first of which consists in a new form given to the share of the plough for the purpose of extending its cutting edge nearly the whole length of the mould-board, and to which share it is proposed to attach a wing for the purpose of breaking the clods in a perpendicular direction; the second improvement is in the peculiar form of the beam which is designed to prevent the plough from choking at the

* These improved ploughs and harrows are manufactured in England by Mr. James Russell, of Wednesbury, Staffordshire.

colter;—the third is a new mode of adjusting the draft of the plough, by which means it may be adapted to cut any required depth or breadth of furrow, and may be drawn by a single or double team of horses;—under the fourth head is described a kind of skeleton plough designed to pass through wet land, and which is so constructed that the earth cannot adhere to the sides; the fifth is a new construction of harrow, with tines so formed and attached that the harrow cannot choke, having a mode of adjustment, by which the depth of its penetrating into the ground may be regulated; and lastly, a new kind of drill-harrow or hoe to be drawn by horses.

Plate VI. Fig. 1, shews a plough to be made entirely of iron, to which the new kind of share is attached. This share *a*, instead of having its cutting edge curved or forming an obtuse angle with the land side, is made straight, and extending nearly the whole length of the mould-board, at an acute angle with the landside. At the back part of the share, a triangular piece, or wing, *b*, is to be introduced occasionally by screwing its pin into a hole in the share, for the purpose of enabling it to turn and accommodate itself to the way of the plough. The intended purpose of this wing is to cut the clods of earth, and break them in a perpendicular direction.

In order to prevent the plough from choking at the colter, the beam is made to curve upwards as seen at *c*, the colter being introduced at the underside, and made fast by wedges. Another contrivance to effect the same object, is shewn at fig. 2, and consists in opening the beam by lateral curves *c c*, the colter being attached by screw bolts, and rounded off at top. By these means, should any stubble or other vegetable matters accumulate in front, they would be enabled to rise over the top

of the colter without choking or obstructing the progress of the plough.

For the purpose of regulating the depth at which the share shall cut the ground, the shackle by which the plough is drawn is to be shifted higher or lower, at the muzzle or nose of the beam. This is done by means of a screw, *d*, in fig. 1, which passes through the bolt of the shackle, and by being turned moves the shackle higher or lower, and thereby causes the share to be drawn through the ground at a less or greater depth beneath the surface, as circumstances may require. The mode of adjusting the lateral draft of the plough so as to give the share more or less land, and also to enable it to be drawn by a single or double team of horses, is by the addition of a bar *f*, fig. 3, to the end of which one of the drawing shackles is to be attached. The plough, shewn at fig. 3, is constructed in every respect upon the ordinary principles of what is called a Scotch plough, the side bar only excepted, which by sliding horizontally in a lateral direction upon a plate *g*, may be set at any angle to the beam, and being there fixed by a bolt, will cause the plough to follow a certain course to which the draft by the adjustment of the bar will incline it.

The skeleton plough, fig. 4, designed for wet land, is constructed of bars set in the usual form of the mould-board, and landside; these bars may be either square or round, and set by screws or bolts, cradled together so as to produce the general figure of those surfaces. The object of this construction is that the earth shall not adhere to the surfaces, but pass through between the bars, and by that means allow the plough to clear itself as it proceeds.

Fig. 5, represents the improved harrow, it is formed

of bars, which support a peculiar sort of tines, (shewn detached at fig. 6, and another form at fig. 7.) The intention in forming these tines with rounded heads, is that the stubble, roots, and other vegetable matters may be enabled to rise over the top of the tines, and clear them. In order to regulate the depth at which the tines of this harrow shall penetrate the ground, the carriage of the forewheel is connected to a lever bar *a*, by the raising and lowering of which the nose of the harrow is depressed or elevated to any required distance from the ground, and consequently the depth to which the tines are intended to penetrate will by these means be determined. The lever that regulates the fore-wheel, is held at the hinder part of the harrow, by a spring-guide, *b*, consisting of two rods placed close together with swells or bands, forming open spaces at several parts for the lever to rest in. When the tines are intended to penetrate the ground to the greatest depth, the handle of the lever must be raised to the top of the guide, but when the tines are to be drawn out of the ground, the handle must be pressed upon, so as to cause the lever to fall to the bottom of the guide, the elastic lateral pressure of the guide holding the lever in any intermediate position to which it may have been shifted for adjustment. As it is frequently necessary to lift the tines of the harrow out of the ground instantly, without stopping the horses, as in turning at the head-lands, that may be done by merely pressing upon the handle of the lever. The hinder wheels of the harrow are also to be raised or lowered to correspond with the fore wheel, and this is done by means of screws, *c c*, which pass through the end bearings of the frame into the axle of the wheels.

The last improvement proposed is a horse-hoe, or

drill-harrow, with peculiarly formed tines attached to the frame work, as seen in fig. 8. One of these tines has been shewn at fig. 7, and before alluded to, as designed to permit the stubble to rise over its top, and thereby to relieve the hoe or harrow from choking. At the sides of this hoe, scufflers are introduced, their extremities being formed like shares for the purpose of cutting away obstructions.

In describing these improvements, the patentee has been necessarily induced to exhibit the entire figures of such ploughs and harrows as the improvements are applicable to, but he expressly states that his claims of original invention are limited to, and embraced by the six heads above described.

[*Inrolled, July,* 1824.]

We have seen testimonials from a number of highly respectable agriculturists, expressing their unqualified approbation of the efficacy with which these ploughs performed when employed upon rough and unbroken ground, for which they are particularly designed: and the manner in which they throw off the stubble, permitting those obstructions to escape without clogging the progress, is obviously calculated to diminish the labour of draft, as well as perform clean work.

EDITOR.

TO THOMAS WOLRICH STANSFELD, *of Leeds in the County of York, Worsted Manufacturer,* HENRY BRIGGS, *of Luddenfoot, in the Parish of Halifax, in said County, Worsted Manufacturer;* WILLIAM PRI-

CHARD, *of Leeds, aforesaid, Engineer*; *and* WILLIAM BARRACLOUGH, *of Burley, in the Parish of Leeds, aforesaid, for their inventions of certain Improvements in the construction of Looms for weaving Fabrics, composed wholly, or in part of Woollen, Worsted, Cotton, Linen, Silk, or other materials, and in the machinery and implements for, and methods of, working the same.*

[Sealed 5th July, 1823.]

THE subjects of this patent are embraced under three heads, the two first of which are different modes of giving out or delivering the warp from the warp-roller or beam of a power-loom; and the third is a method of increasing and diminishing the tension of the warp at intervals for the purpose of assisting the operation of weaving. Plate VI. Fig. 9, is an end view of a power-loom, with the appendages proposed under the first improvement; *a*, is the main shaft or axle of the loom turned by a band and rigger, or by gear, connected as usual with a steam-engine, water-wheel, or other first mover; upon this shaft is fixed an excentric wheel *b*, which is embraced by a ring, and to this ring an arm *c*, is fastened for the purpose of moving the lever *d*, up and down in the arc shewn by dotts, as the excentric wheel revolves. To the lever *d*, a pall *e*, is jointed which takes into the teeth of a ratchet wheel, *f*, and by the descent of the lever the pall *e* is made to draw the ratchet-wheel *f* round a small portion of a revolution, but in the ascent of the lever the pall slides over the teeth, and thus by the continuous rotation of the main shaft *a*, and excentric wheel *b*, the lever *d*, is kept vibrating, and the ratchet-wheel is carried round by the

successive strokes of the pall. Upon the axle of the ratchet-wheel there is a pinion, *g*, that takes into a toothed-wheel *h*, affixed to the end, or to the axle of the beam or warp-roller *i*, and thus by the rotation of the ratchet-wheel, the warp-roller or beam *i*, is made to turn very slowly, and to give out as much length of warp as may be necessary to supply the draft of the work roller *k*.

As the operation of weaving proceeds, the warp will be gradually drawn off, and reduce the diameter of the beam or warp-roller, consequently the delivery of the warp would not be uniform without some mode of compensation; this is effected by means of a vertical lever *l*, the upper end of which has a broad surface pressing against the periphery of the warp-roller, in which situation it is held by a cord with a weight suspended, and the lower end of the lever is connected by a rod *m*, to the arm *c*, extending from the ring, that embraces the excentric wheel. This rod *m*, is attached to the lever *l*, by a pin, forming a joint and to the arm *c*, by a bolt passed through a long curved slot in the lever, *d*. Now as the diameter of the warp wound upon the roller diminishes, the upper end of the lever *l*, approaches nearer towards the roller, and the lower end of the lever receding draws the arm *c* by the bolt at the end of the rod, along the slot into a perpendicular position thus increasing the arc in which the lever *d*, moves, and causes the pall to take up a greater number of the teeth of the ratchet-wheel at every stroke, and consequently to give an increased velocity to the rotation of the beam, *i*, and deliver the warp more rapidly.

The second improvement is another contrivance for the same purpose, viz. the delivery of the warp in a power loom. Fig. 10, represents the end of a power-

loom, in which *a* is the main shaft, actuated as before said by a band and rigger, or gear from any first mover. Upon this shaft is an endless screw that takes into a wheel *b*, having oblique teeth; on the axle of this wheel is another endless screw *c*, taking into a similar wheel *d*, attached to the end of a friction-cylinder *e*. The pivots of this friction-cylinder are supported by brackets at each end of the machine (shewn by dots) and hang loosely in long holes or slots formed in those brackets; *f* is the roller or beam upon which the warp is wound, and at its extremity a wheel or pulley *g* is affixed. A bent lever or arm *h*, having its fulcrum in the bracket above described, presses against the axle of the friction-cylinder, and by means of a cord attached to the end of this lever, and passed round the wheel *g*, with a weight suspended, the friction-cylinder is brought up in contact with the warp-roller, or beam.

It will hence be perceived, that by the revolution of the main shaft *a*, the endless screw *c*, is actuated, which taking into the wheel *d*, gives a rotatory movement to the friction-cylinder *e*, and by the friction cylinder pressing against the periphery of the warp-roller, the latter is made to turn in a contrary direction, and to give out the warp in the same proportion that the woven fabric is gathered upon the work beam. By the pivots of the friction cylinder turning in slots in the brackets, it is enabled to approach or recede according to the varying diameter of the warp on the roll *f*; and the endless screw *c* is made sufficiently long to take into the teeth of the wheel *d*, whether at its greatest or least distance from the warp roller.

The third improvement is a mode of varying the tension of the warp threads, by which it is intended to relax them when the sheds are opening, and to draw them tight when the batten advances to beat up the weft in figs. 9 and

10, this apparatus is shown in different positions; *n* and *o* are two small rollers or rods extending across the back of the loom; the roller *n*, is pressed upwards against the warp threads by a small wire spring; the roller *o* stands above the warp threads, its pivots being supported by two vertical rods *p*, which are attached to the ends of levers *q*. The longer arm of the lever *q*, lies upon the peripherry of an excentric cam or heart-weel *r*; and this heart-wheel is turned round by an arm *s* connected to a crank on its axle, and to the batten *t*, hence, by the vibrations of the batten, the heart-wheel is actuated, or it may be put in motion by any other convenient attachment to the working parts of the loom.

When the highest point of the cam or heart-wheel is acting against the longer arm of the lever *q*, the roller *o* will be drawn down as in fig. 10, and the warp threads drawn tight; but when the lowest point of the cam is acting against the lever as in fig. 9, then the roller *o* will be raised, and the warp-threads relaxed, which is the case when the sheds are passing each other.

It has not been thought necessary to particularly describe the construction and action of a power loom, as the improvements of the present Patentee's, are confined to the objects and machinery above set forth, but the mechanism of a power loom, and its mode of operating, may be seen, by reference to Bowman's Patent, Vol. II. and Roberts's Patent, Vol. VII. of this Journal.

[*Inrolled, January,* 1824.]

To BENJAMIN ROTCH, *Esq. of Furnival's Inn, in the City of London, for his Invention of an Improved Fid, for the Upper Masts of Ships and other Vessels.*

[Sealed, 21st August, 1823.]

THIS improvement is a mode of supporting the upper

mast of a ship, by means of two levers adapted to suitable frames or carriages of iron, attached to the upper cross-trees, and which contrivance also admits of the mast being lowered without slackening the rigging.

Plate VII. Fig. 2, represents a section of the upper cross-trees, with the iron frames and levers attached thereto, supporting the top mast. Fig. 3, is a side view of one of the iron carriages, with part of the lever, upon a larger scale; *a* is the lower part or heel of the top mast; *b* the top of lower mast; *c* the fid-plate, of three times the ordinary thickness; *d d* are the two levers turning upon gudgeons *e e*; and here it may be observed, that the fid-plate which supports the top mast, should rest upon the shorter arms of the levers, as near the gudgeons as possible; *f* is a pall attached to the underside of the lever, which acts as a block or wedge to confine the lever in its place; this pall turns upon a pin or axle, and may be lifted, by drawing up the ring *g*.

The top mast is to be raised to its station by the usual methods, and then the levers *d d* turned, (by pressing upon their longer arms,) into horizontal positions, as seen in fig. 2; the palls are then let fall into their places, as shewn, and by their ends bearing against the back parts of the carriage the levers are confined in their positions, and the mast supported firmly, or in nautical language, the mast is *fidded*.

When the fid is to be removed for the purpose of lowering the mast, the longer arms of the levers are to be pressed upon, and the palls or wedges being by that means relieved, may be drawn up by the rings *g*. The smaller ends of the wedges now sliding up the inclined planes into the recesses, at the back of the carriages, permit the longer arms of the levers to rise, which they will do by the weight of the mast bearing upon their shorter arms, and

when they are thus forced out of the fid holes, the mast may be lowered away by the top tackle pennant.

A slight variation in the above mode of confining the lever fid, is proposed by the introduction of a bolt or pin, instead of the pall or wedge; this is shown at fig. 4: in which nearly the same form of the lever is adopted; but a curved hole or slot is made as at *a*; and when this slot is brought opposite to a round hole in the carriage, the pin or bolt *b* may be introduced, which confines the lever fid in its place.

The patentee states in conclusion, that a lever or levers may have been used heretofore, for the purpose of assisting to raise a top mast to its place, but such levers as those above described fitted to iron carriages, for the purpose of fidding and unfidding the upper-mast of a ship, and with palls or bolts, &c., for retaining the mast in its situation, are, to the best of his knowledge and belief entirely new, and therefore claimed by him.

[*Inrolled, February,* 1824.]

To William Harwood Horrocks, *of Portwood within Prinnington, in the County of Chester, Cotton Manufacturer, for his Invention of a certain New and Improved method applicable to Preparing, Cleaning, Dressing, and Beaming Silk-Warps, and also applicable to Beaming other Warps.*

[Sealed, 24th July, 1823.]

The intention of the patentee is to perform the several operations of preparing, cleaning, dressing, and beam-

ing warps for the weaver, at one and the same time, in a machine, or combination of apparatus, such as is exhibited, in a side view, in plate VII. fig. 7. The silken or other threads of which the warp is to be formed, are to be drawn from a series of bobbins placed on horizontal axles in a stand as usual, shewn at *a*. These threads converge and pass through the reed *b*, the whole series of them forming in width a broad flat shed equal to the breadth of the intended warp. After passing the reed by which the threads have been formed into a warp, they proceed over the small roller *c*, and under the large roller *d;* the circumference of this roller is to measure the quantity of the warp passed under it, which is to be indicated in yards by a dial and counting apparatus attached to its axle. From the under side of the roller *d*, the warp passes upwards over the small roller *e*, from whence it proceeds to the dressing or sizing rollers.

Previous to the operation of dressing, i. e. stiffening or sizing, the warp must be cleaned by picking in the usual way; this is to be done in the space over which the warp is extended between the carriage of the rollers *c*, *d*, *e*, and the sizing apparatus; *f* is a second reed, through which the threads of the warp pass, and *g* is a small roller intended to communicate size or gum to the under side of the warp; *h* is a trough containing the stiffening matter; and *i* is a roller covered with cloth, or other absorbent substance, turning round in the trough, which, by its rotation, delivers the size or gum on to the periphery of the upper roller *g*, to be communicated to the warp as it passes over that roller; *k* is a small roller, the pivots of which are suspended in arms extending from the ends of the axle of the roller *g*. The intention of this roller *k* is to keep the warp down in contact with the sizing roller, and by the pressure which it gives, a greater or less por-

tion of the surface of the sizing roller will be embraced by the warp.

The standard *l l* supports the warp-beam *m*; and from the sizing apparatus the warp is conducted through the reed *n*, and under the guide roller *o*, to the warp-beam. The rotation of the warp-beam, by which the warp is drawn forward through the several machines, is effected by the revolution of the axle *p*, turned by a rigger and band communicating from the working part of a steam-engine, or other first mover. Upon the end of this axle *p*, a bevel-wheel, or endless screw, turns the vertical-shaft *q*, and that, by a similar contrivance at top, turns the warp-beam *m*, and causes it to wind the warp.

In order to spread the stiffening matter uniformly upon the warp-threads, a brush *r*, is placed upon the top of a vibrating rod *s*, near the sizing apparatus. This rod, which moves upon a centre, is actuated by means of a crank, *t*, upon the end of the shaft *p*; and as that shaft goes round, the brush is made to traverse to and fro under the warp, and thereby to spread the gum or other stiffening matter uniformly upon the threads. For the purpose of assisting in drying the warp, a flyer *v* is placed in the standard, and made to revolve by means of a pinion upon the end of its axle, actuated by a toothed-wheel on the shaft *p*; the rapid rotation of this flyer circulates the air against the surface of the warp as it rises up to the warp-beam, and greatly assists in drying it.

Another series of apparatus, exactly similar to that just described, for preparing, cleaning, dressing, and beaming the warp, is proposed to be placed on the opposite side of the main standard *l*, by which means the process may be doubled, that is, two warps may be prepared at one time.

As it may not be possible always to prepare the exact

quantity of warp required for a certain loom, the patentee proposes to divide the threads dressed at one operation into equal portions, so that any number of those portions may be taken up upon distinct rollers, and drawn off in a detached machine on to the warp-beam, which may be thence removed by the weaver to the loom, and another beam placed in its stead, to be charged with warp in a similar manner.

[*Inrolled, January,* 1824.]

To WILLIAM HARWOOD HORROCKS, *of Stockport, in the County of Chester, Cotton Manufacturer, for his new Invented Apparatus for giving Tension to the Warp in Looms.*

[Sealed, 15th June, 1824.]

THERE have been various contrivances for giving tension to the warp in looms, by means of weights suspended to cords, which pass round the warp-beam; by gear actuated by a ratchet and pall connected to the lay; by a series of wheels and levers, as in Stansfeld's patent, page 174 of this volume, and several other modes. The present improvement is a method of restraining the delivery of the warp by friction, and consists of a hoop embracing a wheel at the end of the warp-beam.

Plate VII. fig. 8, represents the end of the beam or warp-roller *a*, upon which a wheel or pulley *b* is fixed. Fig. 9 shews a section of the same, exhibiting the end view of the hoop or clasp which embraces the pulley; *c* is a standard of iron, with a semicircular bend at top,

which standard is made fast at bottom to a block stationed on the ground; *d* is a corresponding piece of iron with a semicircular bend, which is attached to the standard by screw bolts at *e* and *f*. It is hence obvious, that according to the screwing up of the bolts, so will the pulley be pressed by the two semicircular bends or hoop which embraces it, and as the warp is drawn off by the work-roller in front of the loom, the pressure of the hoop against the periphery of the pulley will create so much friction as to restrain the turning of the beam or roller *a*, and thereby keep the warp threads at a proper tension.

[*Inrolled, December*, 1824.]

To HENRY CONSTANTINE JENNINGS, *of Devonshire-street, in the Parish of St. Mary-le-bone, in the County of Middlesex, Esq. for his Invention of an Instrument or Machine, for Preventing the Improper Escape of Gas, and the Danger and Nuisance consequent thereon.*

[Sealed, 14th August, 1823.]

THIS is a very ingenious appendage to a gas burner, and is constructed upon the principle of two dissimilar metals attached together expanding differently under the same temperature, like some of the compensation balances attached to chronometers. The aperture through which the gas rises from the pipe to the burner is to be closed when the gas is not burning, by a ball resting in a concave socket at the top of the aperture. This ball is suspended by a bent arm from a pin set in the top of the burner,

which arm is formed of two dissimilar metals, as two thin strips of brass and steel attached together by sliding joints. The pin supporting the arm being heated communicates that heat to the two thin strips of metal, which by curling up as they expand, draw the ball upon one side out of the socket, and thereby open the passage by which the gas proceeds to the burner.

Plate VII. fig. 10, shews a section of the burner with the improvement attached. The gas proceeding from the pipe below rises up the passage *a* of the fixed socket *c c*, and would pass into the burner, but that the ball *b* resting in the concave aperture at the top of the socket closes the passage. In order to permit the gas to pass into the burner for the purpose of lighting it, the upper part of the burner must be raised; this may readily be done, as the lower part of the burner slides in the socket *c c*. Lifting up the burner therefore by the hand raises the ball *b* out of the socket, and the gas passes through the passage *a* into *d*, and up the lateral tubes *e e* to the burner.

When the gas round the burner has been on fire about a quarter of a minute, the pin *f*, which is enveloped in the flame, will have become hot, and this heat having communicated to the bent arm *g*, that arm will curl up as shewn by dots, in consequence of the different expansions of the two dissimilar metals of which it is made. The ball having been thus drawn aside from its seat, the burner may be let down again to its former position, and the gas will continue to flow through the passage as long as the arm remains curled up by the expansion, but when the flame is extinguished, the pin and the bent arm becoming cold, the ball will resume its former situation, and close the passage of the gas, even though the stop-cock had negligently been left open.

The contrivance by which the gas is to be turned on and off, that is to say, the stop-cock, will be best understood by reference to the horizontal section, fig. 11. The outer ring *c c* shews the extreme diameter of the socket in which the burner slides up and down as before said; in the lower cylindrical part of the burner, a recess *h* is made, extending one quarter of a circle, with a pin *i* passing through the outer rim into the recess, for the purpose of confining the turning of the burner to that distance. In the centre of this horizontal section will be seen the circular passage *a*, up which the gas rises from the pipe below; on the side of this passage a lateral opening is formed for the gas to proceed into a semicircular recess *k* in the lower cylindrical part of the burner; this recess is shewn in fig. 11 as turned away from the lateral opening, as it would be when the stop-cock is closed, but in the vertical section fig. 10, it will be perceived that the passage is open, the recess *k* being there opposite to the lateral opening, and therefore in this position of the aperture the gas is allowed to pass from the lower passage through the recess *k* into the upper part of the burner.

By the contrivance first described, it will be seen that the aperture to the burner becomes closed whenever the light is extinguished, even supposing the stop-cock is left open, and that by these means the great nuisance and danger arising from the flow of the gas when not burning is hereby effectually prevented.

[*Inrolled, February,* 1824.]

To JAMES HOLLAND, *of Fence House in the Parish of Aston, in the County of York, Shoe-maker, for his Invention of certain Improvements in the Manufacture of Boots and Shoes.*

[Sealed, 31st May, 1824.]

THE improvements herein proposed consist in making the soles of boots and shoes principally of wood, with hinge joints, the leather of the welts being folded over the edges of these wooden soles, and made fast by nails or screws. The particular construction of these soles are shewn in Plate VII. Fig. 12 represents the under side of a sole suited to a man's boot, and fig. 13 is a section of the same; there are hinge joints at *a* and *b*, for the purpose of giving flexibility, that the sole may bend and accommodate itself to the motion and foot of the wearer.

The sole may be made of any suitable light wood: that which is least likely to split is to be preferred. The wood is to be boiled in lime water, and when it has become dry it is to be soaked in oil. The inside of the sole may be covered with a piece of cloth steeped in tar, to render it impervious to water. The upper leather and other parts of the boot are to be made by sewing, in the same way as usual, and the edges of the leather turned over the bevel edges of the sole, and made fast thereto by nails or screws, as above said. The boot being thus made, suitable iron tips are to be attached to the toe and heel, when it is to be considered finished.

A differently constructed sole is proposed for shoes, similar to that shewn at fig. 14, of which fig. 15 is a section. The toe part *a*, is of wood, so also is the heel part *b*, but the middle or small part *c*, is to be of leather. A hinge joint is to be formed at *d*, for the purpose of

affording play to the toe part of the shoe in walking, and the thick substance of leather in the small of the foot (attached to the wood by screws or rivets) is to afford the necessary elasticity. The upper leather, quarters, and welt, are to be made as usual, by stitching with wax-ends, but the leather is to be brought over the edges of the sole, and made fast as before described, by small nails or conical wood screws.

These boots and shoes are stated to be twice as durable as those commonly made with leather soles: are capable of being finished with equal smartness, and are not in any degree inconvenient to the wearer.

[Inrolled, July, 1824.]

To HENRY SMART, *of Berners-street, in the Parish of St. Mary-le-bone, in the County of Middlesex, Piano-Forte Manufacturer, for his Invention of certain Improvements in the Construction of Piano-Fortes.*

[Sealed, 24th July, 1823.]

THESE improvements apply to upright piano-fortes, and consist in an improved mechanism connected with the hammers, and with the keys, for the purpose of preventing the hammers from rebounding against the strings, and also shortening the action when a quick repetition of the same note is to be performed. The mode of effecting this object cannot well be understood without reference to the representation of the hammer, the key, and appendages shewn in Plate VII. Fig. 1.

Every key of an upright piano-forte, upon this improved principle, is to be furnished with the mechanism

here shewn; *a* is the key supported, and vibrating upon the centre rail, as usual, with a pin passing through it. At the hinder part of the key a small staple is fixed, which carries the lever *b*; the top of this lever acts against the block *c*, or piece into which the stem of the hammer is set, and hence the depression of the key at one end by the finger of the performer, causes it to rise at the reverse end, throwing up the lever, and impelling the hammer against the string of the instrument.

This is stated to be the common construction of a certain description of upright piano-fortes called the grasshopper action. The improved parts are now to be described; *d* is a small piece of wood rising upon a sort of hinge-joint, and through an oblong hole or slit, in this piece, the lever *b* passes freely. In order that this piece *d* may rise whenever the key is struck, a small stud *e* is inserted into the lever, which stud, by striking against the under side of *d*, lifts it up. This stud, for the purpose of more accurately adjusting its action, is made with an excentric or snail head, so that by turning round its screw pin the edge of the stud may be placed at a greater or less distance from the underside of the piece *d*, and consequently when in action will raise it more or less, as may have been found necessary in the previous adjustment.

Near the extremity of the piece *d*, a wire is introduced with a pad *f* at top, for the purpose of catching the tail part of the block *c* as it falls back, thereby preventing the stem of the hammer from striking against its rest as usual, and from which it frequently rebounds, giving a second blow to the string, so as to produce a jarring sound.

The positions of the parts when the note is struck are shewn by dots in the figure, and it will be seen that if

a quick repetition of the same note is required, the pressure of the finger upon the key will cause the notch or shoulder of the lever *b* to lift the block *c*, and give the note instantly, as the hammer now standing so near to the string does not require that time to perform its action which it would do if it had fallen back upon its rest. Releasing of the key however by the removal of the finger, permits the parts to return slowly to their quiescent state, and the hammer to fall back upon its rest.

There are many parts of this mechanism which are not new, and are therefore not claimed under this patent, the improvements being limited to the piece *d*, with its adjustable lifting stud *e*, the catch *f*, and the tail part of the block *c*, in which the stem of the hammer is fixed. The moving parts are all counter-balanced with weights as usual, in order that they may fall into their proper positions by their own gravity, and the surfaces which come in contact are all covered with soft leather, to prevent the rattling noise which they would otherwise produce when in action.

[*Inrolled, January*, 1824.]

To the REV. JOSEPH ROGERSON COTTER, *of Castle Magnor, near Mallow, in the County of Cork, and Kingdom of Ireland, for his Invention of certain Improvements in Wind Musical Instruments.*

[Sealed, 9th October, 1823.]

THIS invention consists in a peculiar mode of directing or turning the pipes or tubes of wind musical instruments of the serpent and bass-horn kind, by which con-

trivance two new musical instruments have been produced: the one of them possessing the power of giving an improved quality of tone, and even notes that are deeper than the usual natural pitch of the serpent and bass-horn, as well as admitting of a more simple mode of performing the chromatic scale than has hitherto been effected upon instruments of the like kind; the other a tenor instrument possessing similar advantages as to tone and simplicity of fingering: and which is considered to be in itself a great acquisition to music, as a preferable wind instrument of the tenor kind to any at present known.

Plate VII. fig. 5, exhibits two different positions, viz. the back and front of the first description of instrument intended to produce bass notes. The specification states at considerable length the mode of making this instrument, the exact dimensions of every part, and the distances of the holes and key, but not the method of fingering, which in all probability is the same as the fingering of the serpent and bass-horn; it is however presumed that the representation of the instrument given will be sufficient for the general reader. By means of the contortions or turns given to the tube, which is double the length of the tubes of ordinary serpents and bass-horns, a bass instrument of considerable power is produced in a portable compass, and for greater convenience the parts are adapted to take asunder at joints similar to flutes, clarionets, &c.

The lesser instrument for performing in a tenor key is shewn in two positions, at fig. 6, it is similar in its general form and construction to that above described, except that it is on a smaller scale, and thereby gives notes of a higher pitch. Both the instruments are calculated to produce a regular succession of semi-tones, giving the whole chromatic scale for two octaves, or even

more—the natural sounds of the tubes being produced by only six holes, and the two additional holes introduced are not necessary for that purpose. The patentee states that the form of these instruments will admit of some variation, still adhering to the principle; and therefore any such instrument though differing in appearance, which shall be capable of producing a regular succession of semi-tones, giving the chromatic scale for two octaves, without any additional branch or tube, such instrument will be considered by him an infringement on his patent right.

[*Inrolled, April,* 1824.]

To William James, *of Thaives Inn, in the City of London, Land Agent and Engineer, for his Invention of certain Improvements in the Construction of Rail and Tram Roads or Ways, which Rails or Roads are applicable to other useful Purposes.*

[Sealed, 28th February, 1824.]

These improvements in the construction of rail-roads, or tram-ways, consist, first, in making the rails hollow, of whatever form circumstances may render most eligible, the object of which is to reduce the quantity of the metal in the rail, and at the same time to retain the required strength; secondly, in a method of producing a rail with a double road-way, to be firmly fixed as the centre of two lines of rail-way, by which contrivance a saving of one rail in four will be effected; thirdly, in affording the means of conducting water, gas, or other fluid, from place to place, through the hollow tube of the rail; fourthly,

in employing the hollow rail as a trunk to receive ropes, chains, or rods passing from a standing engine, or other actuating machine, for the purpose of protecting these ropes or chains from external injury; and fifthly, in attaching to such rails or tram-ways certain rods, wheels, and endless chains, for the purpose of drawing or propelling carriages along the said rail-way, which rods and wheels are to be actuated by means of a *stationary* steam engine or other stationary power.

The hollow rails are either to be cast in a mould, with a suitable core within, as castings are usually done, or welded, rolled, or otherwise formed, to the desired external shape, leaving a recess within; or they may be made partly of metal tubes connected to stone or wooden sides or bottoms, so as to leave the internal part hollow. This contrivance of rendering the rails hollow, may be adapted to any external form of rail, and will be found to save a very great portion of the expense of metal, and yet retain the same degree of strength as if solid.

The construction of a double line of road with three rails only, is to be effected by making the middle rail of sufficient breadth to allow two carriages to pass each other. Plate VIII. fig. 1. is a section of two lines of road constructed of three hollow rails, that in the middle being broad enough to permit the two carriages to pass freely. This contrivance may be extended to a treble line of road, to be formed of four rails instead of six, and so on, by which means a very great saving of expense will accrue both in the cost of the rail and the labour of laying down the lines. The advantages of the broad rail for reducing the number of lines, may be effected without adopting the hollow rail; these central lines may be constructed by joining together pieces of stone, which should be coated with plate iron or planks of timber.

The employment of such hollow rails for the passage of water, gas, or other fluid, from one place to another, may be advantageously resorted to, where such objects are desirable, without the expense of additional pipes or tubes; and these hollow rails may also be used with great advantage as trunks for conducting chains, rods, or ropes, passing from standing engines, or other machines employed for the purpose of drawing or propelling carriages along the tram-way, which chains, rods, or ropes would by that means be protected from the weather and other external injuries.

The fifth head of the invention respects the attachment of rods, wheels, gear, and endless chains to such rails or tram-ways, for the purpose of drawing or propelling carriages thereon, by the agency of stationary engines.

One mode of affecting this purpose is shewn at fig 2, which is a plan of a double line of rail-road, and fig 3, an elevation of the same. Along the central line *a a*, which is a double rail, a series of rods extend: their extremities being connected together by coupling boxes, clutches, or other means, so as to enable the whole line of rods to turn as one axle, by the actuating power of a steam-engine, or other moving agent, situated at the extremity, or in any convenient part of the line. This power may be applied immediately to the rods, or to the toothed-wheel *b*, under the rail-way, which wheel being made to revolve horizontally, and taking into endless screws or pinions upon the rods, cause them to turn.

Below the rods the toothed-wheel *b* is placed, which revolving horizontally works into the pinions *c* fixed upon the rod. Supposing the power of the engine to be communicated to the toothed-wheel *b*, by means of a lateral shaft and pinion *d*, the revolution of the wheel *b* would cause the rods *a a a* to turn, and other wheels

similar to *b*, being situated at certain distances apart under the rail-way, would also be made to revolve in a horizontal direction, by means of the several pinions upon the central rods.

On the same axle, and under the toothed-wheel *b*, is the large drum-wheel *e*, which revolves with it; round this and other similar drum-wheels situate on the axles of the toothed-wheels, at certain distances apart, the endless chains *f f f f* are distended, and by the revolution of the drums these endless chains are carried round, supported upon anti-friction rollers.

The endless chains being thus actuated, the carriages upon these roads are drawn forward by means of jointed arms *g g* extending from the sides of the carriages, which arms have claws at their lower extremities that drop into and take hold of the links of the chains, and thus, by the progress of the chains actuated as above described, the carriages are drawn or propelled along the rail-road; and in order to continue their progress past the breaks where the chains embrace the drums, the arms *g g* are set so far apart, that when the foremost arm falls out of action in passing the drum, the hinder arm has still hold of the chain, which continues to drive the carriage forward until the foremost arm has come into action with the next endless chain. Thus a succession of loaded carriages may be advanced along one line of the road, and others returned on the opposite line by the agency of the endless chains, drums, toothed-wheel, and line of rods, actuated by a steam-engine, or other moving power, situate at the extremity of the line of rail-road, or at any convenient places upon the line.

Another mode of impelling carriages upon a similar double line of rails, is proposed by the patentee, varying in a slight degree from the foregoing. Fig. 4, is a plan

of such a line, and fig. 5, is a side view or elevation of the same; *a a* is a series of rods passing under the central rail, connected together by coupling boxes as above described. At suitable distances apart on these rails are bevelled pinions, taking into other bevel pinions at the inner extremities of the cross shafts *b b*, and at the outer extremities of these cros sshafts are rotatory cross arms *c c*. On the outer side of each tram carriage, a sort of ladder *d d* is affixed, by arms extending from the axle trees, and thus by the rotation of the central rods *a*, the cross shafts *b*, with their arms *c*, are made to turn; and these cross arms *c*, taking into the ladders, and pressing against the rollers, of which the ladders are formed, by their rotation drive the carriage forward upon the railway.

Economy in the construction of rail roads, has been the primary object of the patentee in these improvements; and from the immense capital proposed to be embarked in several projected lines, which the increased price of iron, perhaps, indispensably calls for, any invention which will materially diminish the weight of the rail, will, he considers, be of public benefit, that is, in case the rail road system really possesses the advantages so confidently ascribed to it.

The first improvement proposed, viz. that of making the rails *hollow*, (independent of the additional strength *said thereby* to be acquired), by the same weight of metal, will give a greater bulk, and consequently create a more solid base in the laying of the rail; a circumstance of some moment where the speedy passage of carriages is required.

The second suggestion, that of producing a double road on three lines, by an increased width of the centre line, (and forming a treble roadway by four lines, and

so on,) is designed to be employed both as a double, and a single roadway; that is, beside being adapted to ordinary tram waggons, it is also calculated for carriages of double width, loaded with cotton, wool, hops, hay, and articles, for which the narrow single lines are but ill adapted.

The third improvement, that of furnishing the means of conducting water, gas, and other fluids, along a rail road, through the rail itself, is intended to be employed when tube rails are laid by the sides of turnpike roads, for the purpose of conducting gas to light the said road in the winter, and water to allay the dust in summer. By such a rail it is also contemplated to supply Salt Water for the Bathing Companies from the Coast, as well as of fresh water for every purpose, from a distance, to those places where it might be wanted. And as the mode of propelling carriages on railways, herein proposed, will enable them to be drawn up a considerable elevation, it is also in the view of the patentee to conduct water, by means of these tubes, from springs on the high land for the purpose of turning over-shot water wheels upon his line of road, which water wheels shall give the rotatory power for actuating the shafts that propel the carriages as above described.

On the subject of the fourth and fifth improvements, which relate to the employment of a new mode or principle of propelling carriages along rail roads, by fixed engines—it is suggested that as doubts exist upon the propriety and advantage of employing locomotive high pressure steam engines, it may be prudent before subscribers entangle themselves with Parliamentary enactments, to consider whether these improvements may not have thrown some new light upon the subject. Two modes of applying the revolving rod as an actuating instrument

for locomotion on rail roads are pointed out, and other modifications would readily suggest themselves. If any of them should be found to succeed. The advocates for the rail road system will silence the main arguments of its adversaries, by the employment of the *low pressure* steam engine, and even the *water wheel*, (where a sufficient head of water can be obtained) as the actuating powers for turning these rods, to propel carriages along the roads, and with rails of only half the weight required for sustaining the ponderous locomotive engine. By this plan, with fixed engines, or water wheels, the road may be laid almost in straight lines, without much inconvenience from the inequalities of the surface. The great expence of tunnelling, cutting, and embanking, will be in a great measure avoided, and much valuable land preserved, besides which the volumes of smoke constantly emitted, and noise of the locomotive engines as they pass, as well as the sad disfigurement of the country, which of themselves, are regarded as great nuisances, will altogether be dispensed with.

[*Inrolled, August*, 1824.]

Original Communications.

To the Editor of the London Journal of Arts, &c.

SIR,

THE subject of roads and road-making having of late occupied a considerable portion of public attention, perhaps you will permit me, through the medium of your

useful Journal, to suggest a novel method of laying down a road-way, suited to the streets of London and other great towns. The principal material of which I propose to make my road is wood; but let not the idea be hastily discarded, because so perishable a material is to be employed, until my views in so doing, and plan of applying it, are fully understood. Many years back I laid down a piece of road of the kind I am about to describe, which has ever since been in use, and remains in good order. I very recently took up a portion of the road, for the sake of observing it, when the wood of which it was constructed appeared to be as sound, and likely to endure, as on the day when the road was first laid down. My engagements having been in the agricultural line, and in the northern part of this island, I have not had that opportunity of exhibiting my plans in operation in the metropolis, which I now intend to do at an early period.

The method of making roads adopted by Mr. M'Adam is unquestionably excellent in its way, and well calculated for open situations; but in the narrow streets of London, and other large towns, where the traffic is incessant, and all descriptions of carriages are constantly rolling over the road in nearly the same tracts, the wear and tear is excessive, and far beyond any thing generally contemplated; consequently, the mud in winter, and dust in summer, will be a nuisance too great to be long endured by the inhabitants.

Conceiving, then, that the public will very soon be convinced that nothing but a stable material will answer for the road-ways in the metropolis, I shall dismiss the consideration of M'Adam's plan, and, without further preface, describe the mode by which I propose to remedy existing evils, and to form a road that shall be stable, durable, clean, and prevent that astounding noise which

is so extremely annoying, not only to strangers, but to the inhabitants themselves.

In Plate VIII. fig. 6, a plan or horizontal view is given of a portion of paving for a public street of the kind which I am suggesting. Fig. 7, is a vertical section of the same taken crossways—*a*, *a*, *a*, *a*, is an oblong box made of cast iron with cross partitions, leaving eighteen square sockets, into each of which a wooden block, the grain upwards, is to be inserted for the purpose of occupying the place of the ordinary paving stones. These block may be of any kind of wood that would answer for that purpose, though I should prefer larch fir, as that is less likely to decay than most other woods, and is more tough and difficult to be split or torn asunder, and when kept damp as it naturally would be while in the earth, would last for ages. The dimensions of these wooden blocks might be about eight inches square on their top surface, and about eighteen inches high, their form as seen in the section, fig. 7, should be slightly tapering from a little below the middle downwards for the purpose of fitting solidly into the recesses of the iron box, and also slightly tapering upwards from the same part, as shewn in the section, for the purpose of allowing gravel or broken stones to be introduced between the wooden blocks when fixed, in order to wedge and confine the blocks firmly, and prevent them from being shook or displaced by the carriages as they pass over.

The iron boxes may be about four feet and a half by two feet and a half on their superfices, and about eight inches deep, or any other dimension that circumstances may render convenient. The bed or foundation of the road being prepared by rolling, ramming, or otherwise, so as to be perfectly solid, and as level as possible; as many

of these boxes are to be laid down as will cover the road, and which are to be made as secure as may be, on the sides, to prevent them from being pushed from their situations, into the recesses of the iron boxes, the blocks of wood previously prepared, and all of one length, are to be introduced, the length-ways of the grain in a perpendicular direction. When they are thus placed, their surfaces being all level, gravel, broken stones, or hard rubbish are to be rammed in between the wooden blocks, and the road will be formed ready for immediate use, in such a firm manner; that neither time, nor the heaviest weights which may pass over it, will in any degree alter its level, or destroy the materials of which it is composed.

The advantages of this plan for paving the streets are:

First. That being laid on an iron floor, and the blocks forming right angles on all sides, the whole would be so completely packed, that there could be no possibility of its being shifted or deranged, as the common carriage-way is subject to, and which makes it so very imperfect.

Secondly. Should any portions of it require to be raised at any time to get to the water or gas pipes, a thing which daily occurs, it could be laid down again precisely in the same manner as it was taken up; whereas in breaking the common road-ways on the M'Adamize plan, the materials cannot again be laid so as to connect or assimilate with the rest, from which it has been broken.

Thirdly. It is evident that there would be much less waste on wood set on end, as above described, than on the hardest whin or granite if exposed to the same wear. I made the experiment many years ago in a pavement upon my father's premises. Our stones frequently sunk, and for experiment, I cut some pieces of wood according

to the size required, and introduced them in place of the stone, set on end in the same manner I have already described, with wood planks at the bottom, and after a lapse of twenty-five years, I observed that the granite has undergone more wear than the wood, the latter of which now stands more prominent and flush than any other part of the causeway that surrounds it. I raised some of the wooden blocks expecting them to have undergone considerable decay, but was surprised on finding that the wood was quite as fresh, as on the day it was laid.

Fourthly. As there is less waste on the wood than on the granite, there will of course be less mud or dirt in wet weather and less dust in dry.

Fifthly. The wood being laid on a complete level between the footways, there would not only be much more accommodation for all carriages, but the streets would also be rendered capable of being washed in the most complete manner, by discharging from the fire plugs as often as necessary a quantity of water, which from the level of the paving would be enabled to flow over its surface, and carry with it all the mud in wet weather, and would lay the dust in dry.

Sixthly. The noise of the passing carriages would be entirely deadened. There would be little vibration and jolting of carriages. They would run along such a wooden street with the same comfort to the riders as they would on the Mall in St. James's Park.

Seventhly. The gas and water mains should be laid in a trough of cast iron, of sufficient size to hold them, extending along each side of the pavement, and might be covered with a cast-iron top or lid, upon which the blocks or pavement would be laid; and when the gas or water-pipes at any time required to be repaired, access could be

had to them at one-fourth of the present trouble and expense.

Eighthly. There would be at least thirty per cent. saved in the wear and tear of horses and carriages.

Ninthly. In proportion as the wooden pavement was introduced, the roads in the vicinity of London would be improved, by the same granite stones, when broken, being applicable to the making or mending of those roads, in preference to the use of the flints.

Tenthly. In the same proportion as the street would be cleared of filth, mud, and vegetable matter undergoing decomposition, (by which the air is so much contaminated) so would the health and longevity of your citizens and inhabitants be preserved and extended.

I am, Sir,

Yours, &c.

JOHN FINLAYSON.

American Patents and Patent Laws.

In our eighth vol, page 35, we noticed some alteration, that, we understood, had recently taken place in the American Patent Laws, which produced many enquiries among our readers, and some doubts arose upon the subject, (see also page 86.) In order to inform ourselves more fully as to the facts, we have made application in the proper quarter, and now present our readers with the information as we receive it.

The ordinary mode of obtaining a Patent, is by *Petition to the Secretary of State,* accompanied with an

affidavit that the Invention is new, or improved, and to the knowledge of the party, not in use in any other country—30 *dollars, the entire official expence,* is paid into the Treasury, and a *receipt* is required to be forwarded with the petition. A *model* must also be deposited in the Patent Office. The *specification* (which should if possible describe in words every particular of the invention, so as to render it perfectly evident even without drawings) must likewise be attached to the petition and sealed, which written specification is incorporated, and becomes the substance of the Patent.

In answer to an inquiry upon the course to be pursued by any foreigner soliciting a Patent in the United States, the following mode is pointed out.

If the party is not a Citizen, or not having resided in the United States, two years previously, he must petition Congress, praying that notwithstanding these disabilities, the Secretary of State may issue a Patent, which Petition is referred to a Committee, who report; previous to which a Bill passes making a law, whereby the party applying is eligible to receive a Patent, complying with the other Rules and Regulations. The Petition must explain the nature of the Invention, and state the intention of the Party to become a Citizen. The Affidavit, Model, Receipt, and Specification as before will be requisite. The expence is of course heavier than in ordinary cases.

American Patents granted 1823.

Buds, Blossoms, &c. (mode of delaying). Robert Moore, Rowan Co. N. C. March 16, 1822.

Bending timber for sleighs, &c. E. Green and M. Blackslee, Litchfield, Connecticut, March 20.

Bank notes, making. George Murray, Philadelphia, March 23.

Blubber, machine for cutting up whale's. Wm. Ball, New York, April 25.

Bricks, machine for making. Benjamin Rolfe, During, N. Hampshire, Ap. 30.

Bricks and tile, machine for making. James C. Stubbs and James Bonner, Cincinnati, Ohio, May 10.

Blocks and wedges, improvement in making. John Thomas, Washington, D. C., May 17.

Bark mill, improvement in the. James Elliott, Philadelphia, May 24.

Bank notes, mode of making. James Ph. Puglia, Philadelphia, August 30.

Bridle for stopping horses. Peter Lamporte, Richmond, Virginia, August 15.

Bleaching unrotted flax. William Cumberland, New York, August 27.

Bedsteads, improvement in. Peregrine Williamson, Baltimore, Oct. 17.

Bricks, improvement in the machine for moulding. H. Maine, Point Coupee, Lou., November 23.

Boots and shoes, improvement in making. A. Buffum, Smithfield, R. I December 28.

Chaff, machine for breaking, &c. John Bolton, Warren, New York, Jan. 28.

Chairs, improvement in nursing. Andrew Woods, Charlestown, Jeff. co. Va. March 13.

Clock cases, improvement in. Joseph Ives, Bristol, Vermont, March 21.

Cock, improvement in the metallic screw. Jeremiah Garey, Baltimore, April 23.

Cloverseed, machine for getting out. William Loomis, Ashford, Connecticut, April 27.

Cock, stop. John Morris, New Haven, Connecticut, May 15.

Cordage, machine for pressing the tar out of. Thomas Barnitt, Philadelphia, May 20.

Churn, improvement in the. Benjamin Hayden, Jr. Trenton, New Jersey, June 15.

Churn, improvement in the. Eleazer Brown Ansel Keith, Windfield, New York, June 19.

Cider, mode of fermenting apple. William Elder, New Brunswick, N. J. August 21.

Cutting box, improvement in the. William Willis, Lynchburgh, Virginia, August 24.

Coffee, machine for hulling. Nathan Read, Belfast, Maine, Sept. 10.

Churn, improvement in the. Samuel Clark, Morris County, New Jersey, October 4.

Cooper's work, machinery for. Horace Wright, Onondaga, New York, October 23.

Cloth, improvement in the machine for shearing. Ezekiah Heald, Norridgwork, Maine, December 4.

Corn, improvement in the mode of grinding. John Bicknell, Buckfield, Me. December 11.

Drawers, improvement in making. Henry Brewer, New York, Feb. 28.

Distilling, improvement in. Philip Greiner, Brandywine, Township, Pennsylvania, April 17.

Dough, machine for making. Josiah S. Fisher and Sylvester W. Talbot, Norfolk, Massachusetts, April 25.

Drill, Cotton thinner and Plough, William Willis, Edgefield District, S. C., May 17.

Distilling, improvement in the apparatus for. Uriah Swetland, Kingston, Pennsylvania, November 18.

Engraving, making metallic plates for. David H. Mason, Philadelphia, May 17.

Elevators, for raising water. Social Rolph, Albany, New York, Nov. 16.

Fire Engine assistant, or life pole. William W. Van Loan, Catskill, New York, February 2.

Fire places, improvements in. Joseph Maggini, Baltimore, February 4.

Ditto .. .. Stephen Spalding, Colchester, Conn. Ap. 11.

Fire Engine, improvement in the. Solomon Lockwood and William Loveland, Little Falls, New York, April 16.

Fire places, mantel and fender for. Elijah Skinner, Sandwich, New Haven, April 19.

Fire engines, improvement in. Ebenezer Higgins, Saratoga, New York, April 27.

Fire places and stoves, improvement in. Lemuel Hitchcock, Weathersfield, Vt., May 4.

Flax, machine for breaking and swingling. S. Davison, Romulus township, New York, May 17.

Flax and hemp machine. Henry Burden, Albany, New York, June 15.

Ditto .. .. William Cumberland, New York, July 9.

Ditto .. .. James Macdonald, New York, August 31.

Forge, hollow fire. Samuel Collins, Springfield, Massachusetts, Sept. 11.

Flax and hemp dressing machine. Naman Goodsell, Paris, New York, September 19.

Floating vessels, machine for. John Denny, Queen Ann county, Maryland, October 3.

Fire arms, improvement in. Albern Holcomb, Litchfield, New York, Oct. 31.

Flumes for mills, improvement in the. A. Messer, Providence, R. I. Nov. 19.

Flax and hemp, improvement in the machine for breaking. William Cumberland, New York, November 29.

Gunpowder, improvement in making. Joseph M. Merrow and Robert M. Kee, junior, East Hartford, Connecticut, April 19.

Glass lights for ships, &c. Joshua Oakes, Boston, May 11.

Ginning cotton, machine for. S. Pennoyer, Cross-river, West Chester, New York, July 24.

Gunpowder, machine for granulating. William H. Richardson, Baltimore, August 3.

Glass buttons, furnace for. Geo. W. Robinson, Attleborough, Massachusetts, August 19.

Glass buttons, finishing. Spencer Richards, ditto ditto August 19.

Gridirons, improvement in. Daniel Ball, Ballstown Spa, New York, Aug. 29.

Glue, improvement in making. John Henry Mark, Philadelphia, Oct. 3.

Gas, making combustible. William Gamet, Rome, New York, Dec. 27.

Horse shoes, improvement in. J. B. Brown and J. Farmer, Boston, March 11.

Hair, mode of taking from the skins of the Nutria. Samuel Brooks, New York, April 4.

Horse hay-rake, improvement in the. Moses Pennock, E. Marlbor'o, Pennsylvania, June 26.

Hulling machine for grass-seeds, &c. Thatcher Blake, Paris, Maine, July 12.

Hydrometer, improvement in the. J. C. Tucker and E. Dwelle, Boston, December 23.

Iron and steel, improvement in making. H. G. Spafford, Albany, New York, October 30.

Kiln for drying malt by steam. David St. Leger, Williamson county, Tenn. August 30.

Kiln for drying grain. R. Andrews, Fleming county, Kentucky, Nov. 7.

Life pole for fire engines. William W. Van Loan, Catskill, New York, February 2.

Lamps, improvement in the tubes for. Deming Jarvis, Cambridge, Massachusetts, February 2.

Looms, domestic. Benjamin Maltby, New York, April 13.

Loom, self-governing. Edmund Warren, New York, May 1.

Lever, angle. James Barron, Norfolk, Virginia, May 14.

Locks and Latches, improvement in. Joel F. Thayer, Boston, May 18.

Leather, improvement in the machine for splitting. Joshua Butters, Boston, May 31.

Lever, improvement in the. Richard Seley, New York, July 1.

Locks for canals. George Bender, New York, August 26.

Locks, improvement in the sliding door. Ebenezer Leman, junior, Boston, November 28.

Lamps, improvement in. C. Cornelius, Philadelphia, December 28.

Mowing machine. Jeremiah Baily, Chester county, Pennsylvania, Feb. 13.

Mockasons and socks, improvement in. William Brower, Ransselear county, New York, March 6.

Mills, improvement in grist. John and David Hascall, Likay, New York, March 9.

Mills, improvement in wind, water, and tide. Peter Quidor, junior, New York, March 21.

Mapping instrument. Samuel Dew, Romney P. O. Virginia, April 13.

Mills, improvement in. Robert Burns, Mifflin county, Pennsylvania, June 20.

Marine railway, improvement in the. John Rogers, Washington, D. C. June 24.

Marble, machine for sawing. Eben W. Judd, Middleburgh, Vermont, August 14.

Mill, floating horizontal wheeled. George H. D. Gray, Southampton, Va. September 25.

Nails, mode of securing the heads of. William Mellus, Dorchester, Massachusetts, August 3.

Nails, machine for cutting and heading. Lemuel Bollis, New York, Sept. 19.

Oil, mode of expressing. John Hallock, Little Egg Harbour, New Jersey, January 22.

Oil, making castor. Timothy Pharo, Tuckerton, New Jersey, February 5.

Pick-axe, improvement in the. Luke Baker, Putney, Windham county, Vt. January 15.

Plough, improvement in the. David Peacock, Northampton, New York, January 21.

Ditto .. .. William G. Shuart, Orange county, New York, February 5.

Pantaloons and waistcoats, making. Charles Herwick, New York, Feb. 8.

Plough, cast iron. Josiah Dutcher, Durham, New York, February 12.

Ditto .. George W. Hawkins and Horace Emery; Windsor, Vt. February 16.

Pressing machine. Philip Freeman, Perth Amboy, New Jersey, Feb. 20.

Press frame, standing. Benjamin F. Brown, New York, March 2.

Plough for hoeing, &c. Col. George Gill and George Gill (B. S.) Chester District, South Carolina, March 25.

Punching holes, machine for. John Sarchet, Philadelphia, April 2.

Printing press, improvement in the. Peter Smith, New York, April 6.

Pails, machine for making. Reuben Hyde, Winchester, Massachusetts, April 19.

Ploughs, improvement in. John Gibson, Montgomery county, New York, May 2.

Paper, machine for making. John Ames, Springfield, Massachusetts, May 14.

Percussion gun, improvement in the. Joshua Shaw, Philadelphia, June 19.

Ploughshare, improvement in the. Baily Carpenter, Somerstown, New Jersey, July 1.

Pipes, leaden, for aqueducts. Richard Ward, Waterbury, Connecticut, July 5.

Plough, improvement in the. Abijah Lee, West Chester, New York, July 22.

Pessaries, improvement in. Luke Baker, New York, September 12.

Plough, improvement in the. Joseph Woolley, Troy, New York, Sept. 14.

Pianos, detached sounding board for. James Stewart, Boston, Nov. 14.

Plough, improvement in the. Peter J. Clute, Schenectady, New York, November 16.

Planking vessels, improvement in. J. Thomas, Washington, D. C. Dec. 2.

Plough, improvement in the. Jacob Schoonmaker and Jacob Dolson, the former of Ulster, and the latter of Duchess county, New York, December 7.

Plough for covering corn, &c. improvement in the. T. Williams, Pittsylvania, Va. December 19.

Quercitron bark, mode of preparing. James Elliott, Philadelphia, Aug. 20.

Rotary steam engine. J. Lansing, junior, and A. Thayer, junior, Albany, New York, January 19.

Razor strops, improvement in. Jacob Houck, New Market, Maryland, January 24.

Railing, ornamenting the tops of. Paulus Hedl, New York, Feb. 21.

Razor strops, composition for. David Ritter, New Haven, Connecticut, March 9.

Rollers, mode of covering. Everet Williams, Stratford, New Hampshire, April 13.

Rigging, attaching the standing. William H. Allen, (killed by the pirates,) United States' Navy, Albany, New York, July 10.

Revolving lever for boats. Lewis Marchand, Blakely, Alabama, July 10.

Rigging vessels, called centre reeving. Samuel Adams Wells, Boston, July 24.

Rigging, called lever, truss, and sling. Ditto ditto, July 24.

Scythes, improvement in. Ephraim Kimball, jun. Fitchbury, Massachusetts, January 17.

Steam engine, rotatory. John Lansing, jun. and A. Thayer, Albany, New York, January 19.

Straw cutting machine. Jonathan S. Eastman, Baltimore, January 29.

Shoes, socks, &c. mode of making. S. Norris and J. C. Wood, Philadelphia, January 30.

Scythes, mode of finishing. Charles M'Namara, Northbridge, Massachusetts, January 30.

Spring sofa, bed, couch, settee, &c. Sh. Blair, New Haven, Connecticut, February 2.

Steam engine, improvement in the. Thomas Hatton, Philadelphia, Feb. 28.

Stove, cooking. Philologus Holley, Red Hook, New York, March 1.

Saddle-trees, machine for making. Reuben Fairchild and Eben Fairchild, Fairfield, Connecticut, March 6.

Stove, improvement in the cooking. John J. Pierce, Greenfield, Massachusetts, March 11.

Spinning woollen yarn, improvement in. John Sharp, Whitestown, New York, March 13.

Spring shuttle spindle, improvement in the. Samuel Cranston, Cumberland, R. I. March 20.

Stove pipe, improvement in making. William W. Weaver, Philadelphia, April 16.

Scraper, or team shovel. Elisha Case, Canton, Connecticut, April 23.

Saw-mill, improvement in the. Thomas White, Chester district, South Carolina, April 27.

Smut machine, &c. improvement in the. Jedediah Tallman, Omeida county, New York, May 8.

Stove, improvement in the. James Barron, Norfolk, Virginia, May 14.

Ditto .. .. B. Seymour and A. C. Bettis, Utica, New York, May 25.

Splitting skins and pelts. William Bent, Philadelphia, June 17.

Stove for burning Lehigh coal. Robert M'Minn, Philadelphia, June 24.

Spindle (trostle) for cotton. Charles Lewis and George Taylor, Poughkeepsie, New York, June 26.

Steam expander. David M'Allister, Bookfield, Vermont, July 15.

Saddle-trees, improvement in. Anthony Null, Philadelphia, August 29.

Sugar, machine for breaking. James Michell, Philadelphia, Sept. 11.

Sleigh shoes, improvement in. Seneca Pettee, Salisbury, Connecticut, Oct. 1.

Seat, elastic spring carriage. Jona. Nichols, Providence, Rhode Island, October 2.

Stills, improvement in. Baltazar J. Kallenback, Philadelphia, Oct. 17.

Stoves for burning Lehigh coal, &c. Philip S. Mingle, Philadelphia, Oct. 24.
Saws, instrument for setting. Joseph Beach, Middletown, Connecticut, October 28.
Steel, improvement in the art of making cast and wrought. Horatio G. Spafford, Albany, New York, October 30.
Stoves, improvement in the foot. Julia Planton, Philadelphia, Nov. 4.
Saw-setter, improvement in the. David C. Jordan, New York, December 2.
Salt, improvement in the mode of making. Cadwallader D. Colden, New York, December 14.
Saw-set, improvement in the. Rufus Grandy, New York, Dec. 21.
Shingles, machine for making, Willard Earl, Boston, Dec. 28.
Saddle-tree, improvement in the. Peter Harry, Harrisonburgh, Va. Feb. 1.
Stoves, improvement in. John Tasker, Philadelphia, Feb. 3.
Seeds, improvement in cleaning. David S. Buck, Hurly, New York, Feb. 10.
Steam boat, canal. Robert Huginin, Albany, New York, March 1.
Transferring impressions. A. C. Baker and Mac Fund Biddle, Albany, New York, Feb. 7.
Telegraph, domestic. Daniel Pierson, Boston, March 2.
Truss, improvement on Hull's. Bela Tarr, Norwich, New York, March 9.
Teeth, improvement in artificial. Charles M. Graham, New York, March 9.
Thrashing and winnowing machine. Alvin Savage, Wheatland, New York, March 28.
Thrashing machine. B. Tyler, J. Tyler, and J. B. Andrews, Windsor, Vt. April 23.
Thrashing machine. Reynolds Gillmon, New York, April 29.
Tayloring, improvement in. Isaiah J. Hendryx, Bennington, Vermont, May 29.
Thrashing, &c. machine for. Major M'Donald, Topsham, Maine, July 10.
Ditto .. ditto Thacher Blake, Paris, Maine, July 12.
Turpentine, distilling. Frederick S. Cozzens, New York, July 27.
Thrashing machine. Joseph Pope, Hallowell, Maine, July 30.
Truss shears, for cutting iron. Enos Baldwin, New York, July 31.
Thrashing machine, improvement in the. Timothy Howe, Turner, Maine, Dec. 3.
Tools, art of making edge. Horatio S. Gates, Troy, New York, Dec. 19.
Venereal disease, preventing the. John Prentis, New London, March 27.
Vaccination, improvement in. James Smith, Baltimore, July 10.
Ventilating vessels. Charles W. Skinner, Norfolk, Virginia, August 23.
Washing machine, improvement in the. Pascal Cady, Brooklyn, Connecticut, Jan. 17.
Wire, improvement in drawing card. Russel Prouty, Spencer, Massachusetts, Jan. 19.
Window shutters and blinds, fastening. Bernice West and Philander Soper, Rome, New York, Jan. 31.
Wheel, polygonal, chain, paddle, &c. Tim Elmer and Azel Pierson, Bridgetown, New Jersey, Jan. 31.
Waistcoats, pantaloons, &c. making. Charles Herwick, New York, Feb. 8.
Window curtains, improvement in. Harry Andrew, New York, March 6.
Winnowing machine. Henry Beadle, Wallingford, Connecticut, March 30.
Washing machine, and for grinding. James Justin, Pittsburgh, Pennsylvania, April 19.
Waterwheel, improvement in the tide. Robert Seal, Delhi, New York, May 31.
Washing machine, improvement in the. Francis Goucher, Philadelphia, June 15.
Windmills, improvement in. William Phoebus, New York, June 24.
Wheels for carriages. John Whitaker, Dingman's Ferry, Pennsylvania, June 24.

Wool-picker, improvement in the. Beriah Brown, Exeter, R. I. Sept. 2.

Window-sashes, self-balancing. Francis Follot, Petersburgh, Virginia, October 15.

Washing machine, improvement in the. David Watson, Fayette, Me. October 15.

Wafer, elevators for raising. Social Rolph, Albany, New York, Nov. 16.

Waterwheel, improvement in the inclined horse and water. Lee Wheeler and Timothy Powell, Coxackie, New York, Dec. 6.

Windmills, improvement in the machinery of. John Gue, Waterford, New York, Dec. 31.

Novel Inventions.

Apparatus for clearing Beer.

Mr. R. W. Dickinson, of *the Albany Brewery, Kent-road*, has invented a very simple and efficacious apparatus for clearing beer while in a state of fermentation. The brightness of malt liquor depends principally upon the care taken in drawing off the yeast while the beer is working. After the wort has been sufficiently boiled with the proper quantity of hops, it is usually run off into coolers, and when its temperature has been by that means sufficiently lowered, it is transferred to a large vessel called a gyle tun. In this vessel, after being mixed with yeast, it undergoes the process of fermentation, and before that is complete is removed into barrels placed side by side on racks, their bung-holes being left open for the yeast, as it rises, to discharge itself, which runs down into a trough placed below to receive it. It is necessary to watch this operation when the beer is in barrels, and to fill up frequently with fresh liquor, to supply the place of that discharged by the fermentation that the vessel may be always nearly full. The improved method supersedes all this trouble and attention, and the beer works in vessels in which it is stored, supplying itself with fresh

liquor in place of the yeast discharged, and always keeping the barrel full.

It is proposed to place all the barrels upright, and having filled them with wort previously boiled, and mixed with the proper quantity of yeast, a pewter pipe, perhaps six or eight inches high, is to be inserted into the bung-hole in the upper end of the barrel, and packed sound, so as not to leak. On the top of each barrel a small tub is to be placed, with a hole in its bottom, through which the pewter pipe is to rise, being securely packed also to prevent leaking, and then into the tub about as much wort is to be poured as will fill up the space in the barrel likely to be emptied by the discharge of yeast. The fermentation going on causes the yeast to rise up the pewter pipe into the tub above, and to supply the vacuity so formed in the barrel below, the fresh liquor in the tub is allowed to run through a small hole in the side of the pewter pipe near its bottom, by which means the barrel is always kept full of beer, and the yeast is received into the tub above.

It is the opinion of Mr. Dickinson, that by the adoption of such an apparatus he saves about one and a half per cent. in quantity, and the beer is by these means greatly improved; he also supersedes the use of a gyle tun, and saves the expense and loss occasioned by transferring the liquor from one barrel to another.

The Society of Arts have voted to Mr. Dickinson their Silver Medal for this invention.

Improved Chucks for Lathes.

EDWARD SPEER, Esq., of New Inn, London, has presented to the Society of Arts, a simple mode of con-

structing chucks, which he conceives will be found of great advantage to the practical turner. His chuck consists of a succession of hollow truncated cones fitting into each other, the outer one screwing on to the mandril of the lathe like a common chuck. These hollow cones adhere together by the closeness of their fitting, and the recess of the inner cone holds the end of the article to be turned, which is made fast in it by screwing up the pivot at the opposite end. This kind of chuck is calculated to obviate the necessity of numerous chucks of different sizes, as it is only necessary to remove so many of the cones as will leave a hollow sufficient to receive the end of the article. Every one acquainted with turning is aware of the trouble attendant on the fitting a piece of wood to the lathe, which by this contrivance is entirely obviated.

The chuck is as well calculated for turning brass, or iron, as wood and other soft substances; and it possesses one advantage which is peculiar to itself, (viz.) it is nearly impossible to injure the turning tool, should it come against a knot, for the friction of the chuck would by such obstruction be overcome, and the cones would slide round one within the other, that is, if the force was not too great by which they were pressed together, and this can always be diminished or increased at pleasure by moving the screw in the back poppit of the lathe.

The cones of the chucks are proposed to be turned at an angle of about ten or twelve degrees to the axis. Cones made of iron and of brass, have been tried by the inventor formed in the same way, but they are not only expensive, but do not answer so well as wood, owing to their surfaces being too smooth; this, however, might be remedied by roughing: but, under all circumstances wood is to be preferred, as they can be made at trifling

expense, and possess sufficient strength, indeed more than can possibly be required in such lathes.

Polytechnic and Scientific Intelligence.

Royal Society.

Feb. 3.—Lord Strangford was elected a fellow; and a paper by Dr. John Kidd, on the anatomy of the Gryllo Talpa, or Mole Cricket, was read.

After remarking, that the best account of this extraordinary animal hitherto published is to be found in Rosel's popular work on Insects, the author proceeds to describe its external appearance, which he says is admirably adapted to its habits of life, the limbs being particularly well formed for burrowing through the earth, and so constructed as to make it almost a matter of indifference to the animal whether he advances or retreats; he is also furnished with two sets of antennæ, one pair proceeding from the head, and the other from the tail. Thus provided, he securely prosecutes his mining operations, guarded in front and rear, and advancing or retreating as circumstances may require, without the necessity of turning, or digging a larger passage than is just sufficient to afford him a passage. The colour is also admirably adapted to the purpose of concealment, being nearly of the same as the earth in which it is found.

The author then gives a very minute description of the form of the animal, which he observes is more distinctly divisible into three separate parts—the head, the thorax, and the abdomen, than most other insects. He notices

the great strength and curious structure of the fore feet, evidently contrived for scooping out and removing the earth, with a brush-like apparatus attached to them, for the purpose of freeing them from any dust that may chance to stick to them. He combats the idea offered by White in his Natural History of Selborn, of its being a ruminating animal, and states that its digestive organs resembles more closely those of granniverous birds, being provided with a gizzard. He offers some objections to the opinion of Cuvier respecting the organs of respiration in insects, and thinks that the longitudinal tracheæ found in that class of animals are for the purpose of enabling them to direct the air to particular parts of the body for occasional purposes. He also controverts the supposition of Cuvier and Marcel de Serres, that the blood is diffused through the general substance of the body, and contends that it circulates through the system, as in animals of a higher class, and thinks the spiral tracheæ are the instruments of such circulation. The component substances of the eyes he describes as similar to those of the mole. Of the nerves he enumerates nine ganglia, distributed at unequal intervals from the commencement of the œsophagus to the termination of the tracheæ; the largest pair of nerves may be traced into the caudal antennæ.

A Letter was also read from Sir Everard Home, announcing the discovery of nerves in the human placenta and navel string.

Feb. 10.—Lord Strangford, and the Rev. George Fisher, were admitted Fellows of the Society, and a paper on the Iguadon, by Gideon Mantell, Esq. was read.

The fossil bones of this extraordinary animal were found in the Sandstone of Tilgate Forest, Sussex, accompanied by various others, among which were some

of a gigantic crocodile, of the Megalosaurus and Plesiosaurus. The teeth are evidently those of some herbiverous animal of an enormous size, if estimated by the proportions of the recent Iguana, not less than sixty feet in length. The author supposes it to have been an amphibious but not a marine animal.

FEB. 17.—Capt. James Mangles, R N. was admitted, and Henry Harvey, Esq. was elected a Fellow of the Society.

A paper was communicated by the Rev. B. Powell, on the nature of the radiant heating effects from terrestrial sources.

The object of this paper is to prove from experiments made with two thermometers, of which one had the bulb covered with a white wash of chalk, the other with India ink, that heat radiated from luminous bodies when intercepted by a pane of glass, is separated into two portions, one of which is absorbed by the screen, the other transmitted through it, and that these two portions differ in their properties, that which is absorbed by the glass, being afterwards equally absorbable by black or white surfaces, whilst that which is transmitted is more easily absorbed by black than white surfaces.

Abstracted Report of the Select Committee of the House of Commons, on Machinery and Artizans, &c.

(Continued from page 106.)

MR. ALEXANDER GALLOWAY, further examined.

ON the effect of the laws against the combination of workmen to raise wages, or regulate their hours of working, Mr. G. stated on his experience, that such combina-

tions only take place where the wages are regular, without regard to merit; but when the men are allowed to make their own engagements, no such thing occurs. Previous to the repeal of the Act 5 Eliz. which took place in 1814, combinations were much more frequent, and every trade was subject to its mischievous provisions; but since then, men are allowed to work at any employment, whether he has served an apprenticeship to it or not, and to make his own bargain with his employer.

Mr. G.'s opinion is, that the combination laws now existing have a prejudicial effect both upon the men and their masters, so as to create ill will. Of his own knowledge, he could not name a single instance of masters conspiring against the men, but if they be allowed to make their own engagements, they need not fear any combination. Mr. G. knows that the masters could conspire against the men with impunity if they chose, because they could carry on their plans with secrecy; on that account the act ought to be repealed, as both parties are not equally protected by it. Seldom or never have combinations taken place where workmen are paid according to their talent.

Mr. G. illustrated his meaning by saying, that in his business there were six or eight different branches or descriptions of workmen,—workers in wood, millwrights, and pattern-makers, founders of iron and brass, smiths at the fire and the vice, brass, iron, and wood turners. It has been the practice in carpenters' shops to pay the workmen 30s. per week, without regard to talent. The pattern-makers wanted to introduce the same at Mr. G.'s manufactory, but it was resisted. M. G. pays his pattern-makers various prices, from two guineas downwards; these men, therefore, have never attempted to conspire, they have only to excel, and behave properly, and their

wages are raised of course; that in all those manufactories where the wages are the same, it is no uncommon thing for the master to pay twice as much as the men have earned. In engineers' shops, the men's wages are usually fixed after a fortnight's experience of their capability; but in a millwright's shop, two guineas per week has been uniformly paid; some of these men were necessarily employed in turning a grindstone, because they would not allow a man whose labour is only worth 18s. per week to work with them. The consequence is, that engineers have become millwrights, and make their machines so much better and cheaper, that millwrights now call themselves engineers, and adopt the engineers' practice.

Mr. G. is decidedly of opinion, that both men and masters should be allowed to make what engagements they please, both as to wages, time of working, and apprentices. It appears to him all that is necessary is to have a law which will oblige parties to do that which they have agreed to do. The greatest benefit is likely to arise to both parties from a repeal of the existing combination laws; leaving them at perfect liberty. A book may be prepared with a printed agreement, such as Mr. G. produced, to which the parties should subscribe their names. Upon the subject of such agreements, in the course of twelve years Mr. G. has not had a single dispute, although he has employed 1,000, or 1,500 men in that space of time.

Mr. Bryan Donkin, Mr. Timothy Bramah, Mr. Philip Taylor, Mr. Henry Maudsley, and Mr. John Hague, examined.

They are all engineers, have received orders for tools and machines from abroad, have not executed all those

orders, on account of the legal prohibitions to certain descriptions of machinery,—cannot state to what amount they have declined orders upon those grounds. Mr. Bramah thinks that within the last seven years he has been deprived of business to the amount of 10,000*l.*; —has an order at this moment for a considerable quantity, not an article of which can be exported unless the prohibitions are removed; he refers to the hydro-mechanical press. Mr. Maudsley has received orders to the amount of 20,000*l.*, which he might have executed but for the prohibitory laws. Mr. Donkin was last year on the Continent, and could have taken orders for a great many screws but for the prohibitions. All agreed that the existing laws have been a great impediment to their business.

If the laws were repealed, not only the demand for, but the price of the work would be increased, and they think permanently--Mr. Taylor dissented from this opinion; he has always found that an increased demand for any article has a tendency to reduce its price; it has been the case with a vast number of machines at present in use in this country, the power-loom for instance; he considers it will not signify whether the demand is for home, or for a foreign country. The great demand for steam-engines has put many heads and hands to work upon them, which has enabled them to be produced at a lower price than they would have been if the demand had been more limited; he should anticipate a reduction in the price of machinery in case an increased demand takes place.

This reduction will not be sudden, nor is any alteration in the price of materials considered, but the progress of ingenuity and improvement may produce it. At present the number of competent engineers is limited, but

the number of skilful engineers may in a short time be doubled, trebled, or quadrupled.

The rearing of competent workmen is not a thing which can be accomplished in a short time; every engineer finding his business increase, and a deficiency of competent hands, naturally has recourse to apprentices, and creates workmen in his own manufactory.

Mr. Donkin's reasons for considering that the price of machinery would increase, arose from a consideration that the raw materials of which heavy machinery is constituted are at present reduced to their lowest rate; they now but barely remunerate the miner. The increased demand would produce a greater consumption, and probably raise the price of labour, which would be generally desirable and beneficial to the country.

Mr. Taylor stated that the proportionate cost of labour to material differed greatly in various machines, some being composed of heavy parts without much work, while the cost of others depend principally upon the labour and fine workmanship; generally speaking the cost of the machine complete bears but a small proportion to the expense of the materials. As to the kind of machinery Mr. T. makes, the proportion would be, perhaps, £100 of materials, to a machine charged £1,200, and some even exceed this. Mr. Maudsley, said, there are many of his machines which do not exceed 14lb. in weight, that ultimately cost £150 or £200. Taking the large kind of machinery where an immense weight of metal is used, and no great quantity of work, Mr. Taylor considers that the materials might cost about half the whole amount of the article; the large Cornish steam-engines for instance, which are made, taking the whole weight together at about twenty-four pounds per ton, the castings

probably costs about ten or twelve. Mr. Donkin considered that heavy machinery, steam-engines in particular, might be taken at about half; but in cotton machinery the expence of materials would scarcely amount to one-tenth. At present there is a glut of the raw material, and the miners' profits are below the ordinary rate compared with the last thirty years; they are below the average rate of profit on their capitals employed at the present time.

A considerable number of furnaces in Staffordshire have been stopt, their proprietors having withdrawn their capital from the circumstance of the article hanging on hand in the market, and being at so low a price. For some years back mining has been carried on at little or no profit, in hopes of better times. The exportation of machinery without restriction would tend greatly to improve this.

Mr. Donkin saw last year, at Wurtzburg, in Germany, a manufactory in a suppressed monastery, established for machinery; there was a foundry, and almost all the iron used was English, so was the coke, and all this for the production of machinery, for which there was a demand, even at the extravagant price that must be charged to realise a moderate profit.

The proportion of the produce of our mines used for prohibited machinery, perhaps, is small compared to that used for other purposes, but if we were to take this in conjunction with other orders, which we should receive in consequence, the quantity would be greatly increased.

[To be continued.]

New Patents Sealed, 1824.

To Edward Lees, publican, of Little Thurrocks, in the county of Essex, and George Harrison, brick maker, of the same place, for their new and improved method of making bricks, tiles, and other articles manufactured with brick earth—Sealed 1st of February—6 months for Inrolment.

To John Thin, of the city of Edinburgh, architect, for his invention of a new method of constructing a roasting jack—1st February—2 months.

To Samuel Crosley, of Cottage Lane, in the City Road, in the county of Middlesex, gentleman, for his invention of a certain apparatus for measuring and registering the quantity of liquids passing from one place to another—1st of February—6 months.

To Samuel Crosley, of Cottage Lane, in the City Road, in the county of Middlesex, gentleman, for his invention of an improvement in the construction of gas regulators, or governors—1st of February—6 months.

To Timothy Burstall, of Bankside, in the Parish of St. Saviour's, Southwark, and John Hill, of Greenwich, in the county of Kent, engineers, for their invention of a locomotive, or steam carriage, for the conveyance of mails, passengers, and goods—3rd February—6 months.

To George Augustus Lamb, of Rye, in the county of

Sussex, Doctor of Divinity, for his invention of a new composition of malt and hops—10th February—6 months.

To Richard Bagnall, the younger, of Leek, in the county of Stafford, silk manufacturer, for his invention of certain improvements in winding, doubling, spinning, throwing, or twisting of silk, wool, cotton, or any other fibrous substances—10th February—6 months.

To John Heathcoat, of Tiverton, in the county of Devon, lace manufacturer, for his invention of certain improvements on the method or methods of manufacturing silk—11th February—6 months.

To Edward Lees, of Little Thurrocks, in the county of Essex, publican, for his invention of certain improvements in water works, and in the mode of conveying water for the purpose of flooding and draining lands, which said improvements are also applicable to various other useful purposes—19th February—6 months.

To Thomas Masterman, of the Dolphin Brewery, Broad Street, Ratcliffe, in the county of Middlesex, common brewer, for his invention of an apparatus for bottling wine, beer, and other liquids, with increased economy and dispatch—19th February—2 months.

To Edmund Lloyd, of North End, Fulham, in the county of Middlesex, gentleman, for his invention of a new apparatus, from which he purposes to feed fires with coal and other fuel—19th February—2 months.

To Benjamin Farrow, of Great Tower Street, in the city of London, ironmonger, for his invention of an improvement or improvements in buildings, calculated to render them less likely to be destroyed or injured by fire than heretofore, which he conceives will be of public utility—19th February—6 months.

To Jesse Ross, of the town and county of Leicester, hosier, for his invention of a new apparatus for combing and straightening wool, cotton, and other like fibrous substances—19th February—6 months.

To Jacob Mould, of Lincoln's Inn Fields, in the county of Middlesex, gentleman, in consequence of communications made to him by a certain foreigner residing abroad, for certain improvements in fire arms—19th February—6 months.

To Henry Burnett, of Arundel Street, in the county of Middlesex, gentleman, in consequence of communications made to him by persons residing Abroad, for certain improvements in machinery, for a new rotatory or endless lever action—19th February—6 months.

To John Beacham, of Paradise Street, Finsbury Square, in the county of Middlesex, cabinet maker, for his invention of certain improvements in water closets—19th February—2 months.

To James Ayton, of Trowse, Millgate, in the county of Norfolk, miller, for his invention of an improvement or spring to be applied to bolting mills, for the purpose of facilitating and improving the dressing of flour and other substances—19th February—6 months.

D.	H.	M.	S.	
1	13	0	0	☿ in conj. with δ in Capri.
2	14	40	50	♃'s 1st Sat. will emerge.
2	19	0	0	☽ in conj. with ξ in Leo.
2	23	0	0	☽ in conj. with ο in Leo.
3	7	0	0	☽ in conj. with π in Leo.
4	9	9	28	♃'s 1st Sat. will emerge.
4	12	36	10	♃'s 2d Sat. will emerge.
4	9	21	0	Ecliptic opposition or ○ full moon.
6	22	0	0	☾ in conj. with ι Virgo.
9	8	11	36	♃'s 4th Sat. will immerge.
9	12	51	7	♃'s 4th Sat. will emerge.
9	13	0	0	☾ in conj. with δ in Scorpio.
10	23	0	0	☾ in conj. with ϑ in Oph.
11	1	0	0	☾ in conj. with B in Oph.
11	2	26	0	☾ in □ last quarter.
11	11	4	2	♃'s 1st Sat. will emerge.
11	15	13	33	♃'s 2d Sat. will emerge.
12	15	0	0	☾ in conj. with 1γ in Sag.
12	20	0	0	☾ in conj. with ο in Sag.
13	9	0	0	☾ in conj. with ♅ long. 18° in Cap. ☾ lat. 1°54′ N. ♅ lat. 25° S. diff. lat. 2° 19′.
17	7	56	47	♃'s 3d Sat. will emerge.
18	12	58	42	♃'s 1st Sat. will emerge.
19	4	23	0	Ecliptic Conjunction or ● New Moon.
20	9	19	0	⊙ enters Aries.
21	7	0	0	☽ in conj. with η in Pisces.
21	11	0	0	♂ in conj. with ζ in Pisces.
22	7	10	4	♃'s 2nd. Sat. will emerge
23	7	0	0	☽ in conj. with ♀ long 17° in Taurus ☽ lat. 2° 59′ N. ♀ lat. 3° 50′ N. diff. lat. 51′.
23	8	0	0	☽ in conj. with δ in Aries.
24	7	0	0	♀ in conj. with δ in Aries.
24	8	22	42	♃'s 3rd Sat. will immerge.
24	11	55	58	♃'s 3rd Sat. will emerge.
25	14	53	27	♃'s 1st Sat. will emerge.
26	17	0	0	☽ in conj. with η in Gemini.
26	20	0	0	☽ in conj. with μ in Gemini.
27	3	10	0	☽ in □ first quarter.
27	9	22	8	♃'s 1st Sat. will emerge.
27	14	0	0	☽ in conj. with ζ in Gemini.
29	9	47	22	♃'s 2nd Sat. will emerge.
30	0	0	0	♃ Stationary.
30	5	0	0	☽ in conj. with ξ in Leo.
30	9	0	0	☽ in conj. with ο in Leo
30	17	0	0	☽ in conj. with π in Leo.
31	12	22	3	♃'s 3d Sat. will immerge.

The waxing moon ☽ — the waning moon ☾

Rotherhithe. J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, JAN. AND FEB. 1825,

1825.	Thermo. Higt.	Thermo. Low.	Barometer +	Barometer −	Rain in inches.	1825.	Thermo. Higt.	Thermo. Low.	Barometer. +	Barometer. −	Rain in inches.
JAN.						FEB.					
27	51	36	29,90	29,94		10	45	31	—,30	—,40	
28	43	33	30,38	30,56		11	47	28	—,40	station	
29	40	25	—,57	—,55		12	42	26	—,40	——	
30	46	—	—,40	—,34		13	—	25	—,40	——	,05
31	51	34	—,36	station	,2	14	38	33	—,33	30,20	
FEB.						15	41	34	—,09	29,97	
1	48	39	—,96	39,15		16	47	36	29,90	station	
2	44	30	—,27	29,85		17	49	35	—,92	—,88	
3	49	37	29,46	station		18	—	39	—,88	30, 5	
4	33	28	—,50	—,60		19	50	42	30,10	—,16	
5	34	24	—,60	—,63		20	54	41	—,14	—,26	,1
6	49	29	—,84	30,10	,4	21	47	31	—,30	—,35	
7	42	—	30,10	29,90		22	—	27	—,35	—,24	
8	45	32	29,85	30,00		23	46	33	—,10	—,17	
9	46	33	30,20	—,30							

CHARLES H. ADAMS, LOWER EDMONTON.

LITERARY NOTICES.

SPEEDILY will be published, Practical Observations on Rail Roads, and on Steam and Water Engines, for propelling thereon, with the Origin and Specifications of several Patent Improvements, and the Reports, Plans, and Sections, from actual survey of the Liverpool, Manchester, and Bolton, Bishops Stortford, and Cambridge, Canterbury—Cornish Union, and several other Lines, adapted for Steam, Water, and Horse Powers, by Wm. James, Land Agent, Engineer, and Manager of the Stratford and Moreton Engine Rail Roads, now executing.

Also, in the Press, an octavo work, to be called the British Farmer, containing a Series of Essays on Agriculture, to which will be added the Ploughman's Guide, with several Plates, by John Finlayson, Patentee of improved ploughs and harrows.

The Proprietors of the Diorama are preparing another piece for Exhibition, which is spoken of in the highest terms. The subject is a view of Rouen; they have imagined a storm, which abates—a rainbow appears—the storm returns, and so on, till the illusion is almost beyond conception. This effort will contain more than has hitherto been produced by art, if it realises what is promised.

BRITISH MUSEUM.—Sir Richard Colt Hoare, Bart., has lately given to the British Museum a splendid library, relating to the History and Topography of Italy, collected between the years 1785 and 1791, during two successive excursions into that country. It consists of seventeen hundred and thirty-three articles, arranged according to the ancient divisions of Italy.

Such has been the effect of the liberality of our Gracious Sovereign, that no fewer than three donations of the highest importance, have been since bestowed upon the British Museum: a collection of pictures, of extraordinary value, from Sir George Beaumont; a collection of Coins, Medals, Bronzes, Gems, and Drawings, estimated in value above fifty thousand pounds, from Mr. R. P. Knight; and a library of Italian History, from Sir R. C. Hoare.

The first part of Sir George Nayler's superb History of the Coronation is completed and ready for delivery, though it has been delayed considerably, its appearance most satisfactorily accounts for the delay occasioned, as it must have been impossible to have calculated accurately the time such a performance would take to complete it. The Costume seems accurate to the utmost minutiæ, and the Plates are splendid in the extreme; the Portraits of the personages are most faithfully delineated, and the colouring is in every way equally excellent.

The Plates in the Part before us consist of His Majesty; the Court of Claims in the Painted Chamber in the Palace at Westminster; Procession of the Dean and Prebendaries of Westminster with the Regalia; the Ceremony of the Homage; and the Royal Banquet.—There are also four engravings on wood, of Cyphers, Crown, Coronets, Medals, &c.

ARCHÆOLOGY.—In the first volume of the "Memoirs of the Archæological Society of Naples is a Dissertation by F. Rossi, on a Medal of Crispus Cæsar, the son of Constantine, which was found at Capua: also another Dissertation by the same on an inscription of P. Ælius Mucianus. The volume contains also a memoir by M. Andres, on Eustatius's Commentary on Homer; M. Andres also treats on a Geographical Chart of 1455, in which is shown the position of the Antilles. M. Avellino has described a golden crown, which was found in 1813, in an ancient tomb near Armento in the Basilicati. This crown is composed of oak leaves interwoven with branches and flowers of various sorts, upon the flowers is represented some bees, and on the leaves six figures, two male and four female. This is the sort of crown of which two thousand were presented at the obsequies of Scylla.

M. Carcari has explained an inscription that was discovered in 1765, on the gate of the Temple of Isis, at Pompeii, concerning a Numerius Popilius, admitted into the number of the Decurions for having restored the Temple. It is said that the second volume of the Memoirs of the Society will contain drawings of this Temple of Isis.

LONDON:
SHACKELL AND ARROWSMITH, JOHNSON'S-COURT, FLEET-STREET.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. LII.

Recent Patents.

To WILLIAM HENRY JAMES, *of Cobourg Place, Winson Green, near Birmingham, in the County of Warwick, Engineer, for his Invention of an improved Method of Constructing Steam Carriages; useful in the Conveyance of Persons and Goods, upon Highways and Turnpike Roads, without the Assistance of Rail Roads.*

[Sealed 15th March 1824.]

THE improvement in the construction of steam carriages, claimed under this patent, consists in adapting separate engines to the gear of each of the wheels on which the carriage runs, instead of actuating them all by one engine as heretofore. These engines are intended to be of small dimensions, and to be worked by steam at a high pressure, which is to be supplied by pipes connected with a boiler or generator, situate in any convenient part

of the carriage. By this adaptation of distinct engines to each wheel, the patentee considers that he shall be enabled to vary the powers communicated to the respective wheels, and to give to each wheel an independant rotatory motion, so as to cause the several wheels to turn with different velocities, which is essential in moving the carriage in curves, or turning corners in the road.

This adjustment of the velocities of the respective wheels is effected by slide valves or stop cocks, which by turning, enlarge or partially close the apparatus through which the steam passes to the respective cylinders. These valves or cocks are worked either by levers, under the control of the director, or the engineer; or by rods connected to the fore axletree, which is contrived to open or shut the slide valves or stop cocks, as it turns upon its central pivot.

Plate IX. fig. 1, is a side view of a stage-coach to be propelled by steam, upon the improved principle of adapting a separate engine of small dimensions to each of the respective wheels. Fig. 2, is a back view of the carriage, exhibiting the engine as attached to the hinder wheels, the pistons of the engine moving horizontally. Fig. 3, is a front view of the fore axletree, the engines being placed vertically; and fig. 4, is a plan or horizontal view of the perch, axletrees, wheels, engines, and levers as combined, the body of the coach being removed for the purpose of shewing the parts beneath.

The wheels on which the carriage runs, move loosely upon their axles as usual, but have attached to their naves, on the inner side, toothed wheels, *a a*. Similar toothed wheels, *b b*, are affixed to the outer extremities of the crank shafts, *c c*, which are actuated by the alternation of the piston rods, *a* and *e*. The teeth of the wheels *b*, take into the teeth of the wheels *a*, and thus by the

revolution of the crank shafts, rotatory motion is given to the wheels on which the carriage runs.

A boiler, or generator of steam, is placed in any convenient part of the carriage, perhaps under the hinder axletree, as at *f*, from whence steam is passed through the pipe, *g*, extending along the perch, and thence through the lateral pipes, *h h*, to the several engines. A stop cock is to be introduced at the junction of the perch and axletrees, or may form the joint connexion between the long steam pipe and the lateral pipes; the turning of which cock, when the carriage is to deviate from a straight course, affords a greater or less supply of steam to the respective engines, and thereby causes them to move faster or slower, by which means the toothed wheels will be severally made to turn with different velocities, and the carriage consequently to run in a curved or circuitous direction.

By this contrivance the guiding of the carriage will be effected by the turning of the stop cocks, as, when a greater supply of steam is allowed to pass into one engine than into the other, that engine will necessarily work faster, and drive the wheel connected to it over a greater surface of ground, while the engine at the opposite end of the axletree, being supplied with a diminished quantity of steam through the contracted aperture of the cock, will necessarily move slower and drive the wheel over a lesser distance of ground.

The levers and rods by which the slide valves or stop cocks that guide the carriage are worked, may be variously constructed; the form and disposition, therefore, shewn in the figures, is only to be considered as one of several convenient modes, by which the desired object might be effected.

In order to put this carriage in motion, the engineer

should place himself in the hinder part below, for the purpose of keeping up the fire, and the steersman or director should be seated upon the box in front. Steam at a high pressure being admitted from the boiler, or generator, into the pipe extending along the perch, it will pass from thence by the lateral pipes, through the steam valves into the cylinders in the usual way, and move the pistons therein, by which means the piston rods will cause the cranks to revolve, and give the rotatory motion to the toothed wheels, as before described; the crank shafts having excentrics or tappets which open and shut the induction and eduction passages, and thereby allow the steam from the lateral pipes to enter the cylinders, and after exerting the required force to escape therefrom through the hollow axles or other tubes, and along an outer passage of the pipe, *g*, to the chimney.

Suppose the axles to stand at right angles to the main steam pipe or perch, the carriage would necessarily advance in a straight forward direction; but in order to guide the carriage round a corner or curved part of the road, the director, seated in front, must turn the vertical shaft, *i*, by means of the horizontal hand wheel, which will cause the axletree of the fore wheels to stand at an oblique angle to the perch, as shewn in fig. 4; when the stop cocks, *k k*, communicating between the main steam pipe and the lateral pipes, will open the aperture wide on one side and contract it on the other, thereby giving an increased power to the engine connected to the outer wheel, so as to make that wheel revolve faster, and a diminished power to the engine connected to the inner wheel, so as to cause that wheel to revolve slower. In order to act in a similar manner upon the hinder wheels, rods, *z z*, extend from a lever upon the square of the hinder stop cock, *k*, and these being attached at their

reverse ends to a toothed sector, *m*, taking into a toothed circular rim, *n*, affixed to the fore axle. Whenever that axle stands at an oblique angle to the perch, the aperture of the stop cocks, *k k*, will admit different quantities of steam into the two lateral pipes, and consequently the hinder wheels also will revolve with different velocities, and thereby conduct the carriage on the road in a curved track.

Whenever it may be necessary to stop the carriage, that is done by completely shutting off the steam and closing the exit passages; for this purpose a rod, *p*, is placed in front, near the seat of the conductor, who, by raising the handle moves the cranks, *o o*, connected to the rods, and by these means the cock, *q q*, which admits the steam from the boiler into the steam pipe for working the engine, is closed, and also the cock which allowed the steam after quitting the engine to escape into the chimney.

In order to enable the engineer behind to stop the carriage if necessary, handles, *r r*, are formed to the hinder parts of the rods of the cock, *q q*, by which means he can instantly close the steam and exit passages; and if it should be necessary under any circumstances to lock one or both of the hinder wheels, for the purpose of dragging, small levers, *s s*, are to be turned, which will shut off the steam from either or both of the engines, and thereby stop the revolution of the wheels previously to putting on a drag.

The patentee does not confine himself to this particular form and disposition of the parts of his improved carriage, as it is particularly expressed that his invention consists in the adaptation of distinct engines to the respective wheels upon which the carriage runs, "for the purpose of actuating such several wheels independantly of each

other;" neither does he limit himself to any particular construction or position of the steam engines so adapted, nor to the form of the carriage to be so propelled.

[*Inrolled, November*, 1824.]

To JOHN JONES, *late of Gloucester, but now of Leeds, in the County of York, Brush Manufacturer, for his Invention of certain Improvements in Machinery and Instruments, for Dressing and Cleansing Woollen, Cotton, Linen, Silk, and other Cloths or Fabrics; and which Improvements are also applicable to the Dressing and Cleansing of Machinery of various Descriptions, and other Articles or Substances.*

[Sealed, 27th January, 1824.]

THESE machines are applicable to the dressing of woollen and other cloths either in a dry or wet state, and may be employed in conjunction with jets of water or of steam; or for dry brushing without either. In Plate X. fig. 1, is a section of one kind of brushing machine upon the improved plan, which is intended to be employed principally for brushing the clothes in a dry state; a perforated pipe may, however, be introduced across the machine, for the purpose of occasionally discharging a sheet of steam against the face of the cloth during the process, or if the machine be employed for wet brushing, a sheet of water may be made to descend upon the cloth in any convenient way.

This section is taken through the middle of the machine, cutting the rollers and other parts vertically;

which rollers or their axles, are supported by the frame-work of cast iron at each end; the width of the machine being made to suit the breadth of the cloths intended to be operated upon, and the whole of the rollers are connected together by bands, gear, or friction, and are put in motion by the rotation of a main shaft, actuated by a steam engine, water-wheel, manual labour, or by any other first mover; *a*, is the main shaft, having at the end a rigger (not seen in this figure) over which a band passes from the steam engine, for the purpose of giving the shaft rotatory motion: at the reverse end of the shaft, the toothed wheel, *b*, is affixed, which takes into the toothed rims *c c*, at the ends of the brushing cylinders, for the purpose of giving them a rotatory motion. These brushing cylinders, *d* 1, *d* 2, are made by an intermixture of hogs' bristles and wires, or goats' hair set round the periphery at an acute angle to thes urface, or radiate in the usual manner, and as the cloth is passed through the machine, the cylinders by their rapid revolutions brush the surface of the cloth, and smoothen its nap.

At the end of the axle of the second brushing cylinder, *d* 2, a pinion is affixed, which takes into the teeth of a wheel on the axle of the shaft *e*, (neither of these are seen in this section, but may be supposed to be situated as shewn by the dotted circles) and at the reverse end of this shaft *e*, there is a pinion that takes into the toothed wheel *f*, affixed to the end of what is called the lower drawing roller *i*.

The cloth about to be operated upon, is to be spread out to its full width, and passed between two retarding rollers, *g* and *h*, that is, over *g* and under *h*, as shewn in the figure; it is next conducted over the brushing cylinders, *d* 1 and *d* 2, with the face of the cloth next to the brushes, and then passed under the lower drawing roller

i, between that and the upper drawing roller *j*, and over that roller, as shewn. The axles of the retarding rollers *g* and *h*, are mounted in levers, and by the assistance of a ratchet-wheel *k*, turned by a winch, the upper roller can be raised so as to give a greater degree of tension to the cloth if required. A weighted roller, *l*, is introduced between the brushing cylinders, for the purpose of keeping the cloth down against the brushes; it may be pressed down so as to give a greater or less degree of tension to the cloth, by means of pins placed into holes in the carriage. The pivots of the upper drawing roller *j*, are hung in levers, and may be raised by the handle *o*, when the cloth is first introduced.

The two ends of the piece of cloth are now to be stitched together, forming it into an endless web, and the machinery is to be put in motion as above described, when the brushing cylinders revolving with considerable rapidity will polish or dress the face of the cloth; which is progressively carried forward by the slow rotation of the drawing rollers, and passing over the top roller, descends on to the inclined plane *m*, and slides down to the floor ready to be drawn up at the front of the machine, to be operated upon again.

A rapidly revolving whisk *n*, is suspended above the first brushing cylinder, for the purpose of cleansing the back of the cloth, while it is undergoing the operation of polishing on the face. Under the brushing cylinder, a trough, *p*, is placed, to receive any flocks or dust that may fall from the cloth while brushing; this, however, supposes the operation to be performed dry; if water is used, a pipe must be inserted at one end of the trough to carry it away. The introduction of a sheet of steam against the face of the cloth while brushing, is said to tend very much towards improving the appearance of

the cloth when finished, and also to take away that harshness of feel which is generally produced by hot-pressing; for this purpose, a steam-pipe is passed through the front part of the machine, as at *q*, under the front brushing cylinder, and being perforated with a series of holes, sends forth a sheet of steam against the face of the cloth, which damps it. This blowing action of the steam is kept on for ten minutes or longer, and the brushing process is to be continued until the cloth becomes dry, when it will be found to have shrunk, and assumed a compact state.

A variation of the same principles, but with only one brushing cylinder, is shewn in the second kind of machine, fig. 2, which is also a section taken vertically through the middle. This machine is intended to be employed principally for wet-brushing, that is, when a stream of water is used; *a*, is a shaft, to which rotatory motion is to be given, either by a winch *b*, or by a rigger attached, to its end. To this shaft a large toothed wheel is affixed (shewn by dots) which takes into a small pinion on the end of the brushing cylinder *c*, made of bristles and wires, as before described, and by that means the brushing cylinder is made to revolve with very considerable velocity.

The cloth to be operated upon is to be passed between the rails *d*, and conducted over the brushing cylinder *c*, and over the upper drawing roller *e*, then between that and the lower drawing roller *f*. From the roller *f*, the cloth descends on to an inclined plane, and when sufficiently brushed, is to be coiled upon the roller *g*, behind the machine. Above the brushing cylinder, a water-pipe, *h*, is carried across the machine, for the purpose of causing a shower to fall upon the cloth as the brush revolves under it.

The rapid rotation of the brushing cylinder being effected in the manner shewn, the cloth is progressively carried forward through the machine, by means of a pinion upon the main axle *a*, which takes into a toothed wheel upon the axle *i*; neither of these however are seen in the section, but may readily be conceived. At the reverse end of the axle *i*, is another toothed wheel *k*, which takes into a large toothed wheel *l*, fixed at the end of the axle of the upper drawing roller; by these means the rotation of the main axle causes both the brushing cylinder to revolve as described above, and the drawing rollers to conduct the cloth through the machine by a slow progressive motion, in an opposite direction, at the same time the sheet of water falling upon the cloth causes it to be scoured and cleansed; there may be a trough, *m*, placed under the brushing cylinder to catch the foul water, as represented by dots, and a pipe may lead from the bottom, for the purpose of conducting it away. There may be steam pipes introduced under the cloth, instead of, or in addition to, the water-pipe described, and by that means the machine may be converted into a dry brushing apparatus if required, or a steam moizer, as it is technically termed. The tension of the cloth may be increased or diminished, by shifting the situations of the rails *d*, which are made to fit into the notches of the curved arms, *n*.

These machines thus applied to the finishing of cloths, produce an appearance upon their surfaces not to be obtained by any other means, and the introduction of steam in this way, is found to be superior in its effects to the process of *roll boiling*. The former of the two machines is also applicable to the brushing of cloth in the rough state previous to milling, and during the process of picking and brushing, but in this case the two brushing cylin-

ders must be made to revolve in contrary directions; this may be done by causing the toothed rims, *c c*, to take into each other.

It is likewise in the contemplation of the Patentee, to employ this kind of machine to clean cards, teasles, carding cylinders, gigs, and other apparatus used in the preparation of cotton, wool, silk, &c. and in the dressing of cloths, and for other purposes to which the same may be applicable.

[*Inrolled, July,* 1824.]

To HENRY POTTER BURT, *of the Borough of Devizes, in the County of Wilts, Ironmonger, for his Invention of an Improvement in the Construction of Cranks, such as are used for Bells, and other purposes.*

[Sealed 14th April, 1824.]

THE patentee observes, that all the bell cranks at present in use move upon an axle or pin, which is firmly fixed to the plate, or driven into the wall, or wainscoat of the room in which they are hung; and therefore whenever any repairs become necessary, such as mending the bell wire, the removal of the crank plate, or the drawing of the pin is indispensable; from which circumstance the paper or colouring of the wall or wainscoat generally becomes damaged, which is a source of very considerable inconvenience. To remedy this, therefore, the present invention is proposed, which consists of several modes of attaching and detaching cranks from their plates, so as to remove and replace them without injury to the walls, cornices, papering, or painting of the room.

In plate X. fig. 6 represents a mortice crank upon the improved principle. The plate *a* may be fixed firmly in its place, but the crank, which turns upon an axle in the standard *b*, may, with its standard, be removed from the plate, by withdrawing the screws of the lips *c c*, there being small notches cut in the plate *a*, crossways of the slot, for the purpose of allowing the standard of the crank to be passed through. By this contrivance it will be seen that whenever any repair of the bell wire is necessary, the crank may be removed, and again replaced, without in any degree damaging the wall, wainscoat, or paper to which the crank plate is affixed.

Fig. 7, shews a crane-formed crank, which, instead of being affixed by driving its pin into the wall, or having its pin riveted to the plate *a a a*, which is affixed to the wall, the crane *b* and its axle are mounted upon a moveable plate *c c*, which may be attached to, or detached from, the fixed plate by screws, as the moveable plate is designed to fall into a recess made in the fixed plate for that purpose. This mode of mounting a crane-formed crank will, therefore, avoid the above inconvenience.

Fig. 8, is an area bell-pull, moving upon a joint at *a*, which is the attaching screw, forming the axle of the crank. At *b*, the rod or wire is affixed, which, for the sake of protection, is to a certain distance down enclosed in a tube, shewn by dots. Fig. 9, is a concave hemispherical pull for a door. This has the same advantages as above stated, (viz.) that when once the hemispherical box is morticed and fixed in the door-post, there will be no occasion to remove it in repairing the bell wire, as the pull, with its socket *a*, may be removed by detaching the socket from the concave to which it has been screwed, and afterwards replacing it in the same way.

[*Inrolled, October*, 1824.]

To ROBERT HIGGIN, *of the City of Norwich, Shawl Manufacturer, for his Invention and Discovery of a new or improved Method of Consuming or Destroying Smoke.*

[Sealed 18th August, 1823.]

THE mode of consuming or destroying smoke proposed herein, is by the introduction of an additional furnace in some convenient part of the flues leading from the ordinary furnace under the boiler of a steam engine, brewers' or dyers' copper, or other boiler. As the constructions of boilers, both in form and dimensions, must necessarily vary according to their uses, the patentee has not thought proper to accompany his specification with a drawing, but states that any competent workman will know how to introduce this auxiliary furnace in such a part of the flue, that all the smoke and other vapour emitted from the fire of the ordinary furnace under the boiler, will be compelled to pass through the fire of the second or auxiliary furnace; and will by that means become burnt and destroyed.

It will of course be necessary to make such draftways to the under side of the grate bars of the auxiliary furnace, as will supply air for the support of its combustion; and it is proposed to burn in this auxiliary furnace, coke or cinders, or some such substance as will not emit smoke, otherwise the object of the patent will be in a great measure frustrated.

[*Inrolled, February,* 1824.]

The mode of consuming smoke proposed under this patent, appears to be the same, or very like that invented by Mr. George Stratton, and for which he obtained a patent in 1822. See our fifth vol. page 174, and plate X. —EDITOR.

To JAMES WRIGHT RICHARDS, *of Caroline-street, Birmingham, in the County of Warwick, Metallic Hot-house Maker, for his Invention of an improved Metallic Frame and Lap, applicable to all Hot-houses, Green-houses, Horticultural Frames and Glasses, Sky-lights, and other inclined Lights and Glasses.*

[Sealed 28th February, 1824.]

THE intention of the patentee, and the particular features of his invention, do not appear to us in a very clear light from the specification. "I make," says he, "an elevated rib or bead on each side of the frame, formed of any metal, or mixture of metals best suited to the purpose—wrought iron is to be preferred (see plate XI. fig. 1, *a.*) To receive this elevated rib, I make a groove in the rafter, as at *b*; and the cross bar, instead of being fixed with a lap to the frame, as in common use, I pass through the frame only, and rivet it on the inside, as at *c*. In consequence, the bars are free to slide up and down their whole length, and a space is allowed for the expansion and contraction of the frame, according to the variations of temperature in the atmosphere; and the water or steam condensed on the frame runs along the groove underneath the elevated rib or bead, and is conveyed into a spout or gutter in front, and does not fall down within the house.

"To secure the passage of the water conveyed in the grooves before mentioned, and also the steam or water that collects on the outside of the rafter itself, I place a copper or metallic tube, angular on the side, and semicircular underneath the rafter, through the whole length, as represented at *d*, which also conveys the water into the space or gutter, and prevents it from dropping within the house.

"I make the metallic lap in the following manner:—First, I take a piece of metal, or metallic compound, but prefer copper, rolled thin, of the length of four inches, and the width of nine inches, or any other length or width, dependant upon the size of the pane, and by bending it form two curves or cavities, one on one side, and the other on the other. In the single groove or cavity, I place the edge of half the lower pane of glass, and in the highest on the other side, the edge of the corresponding half of the upper pane, and secure them in their position by putty, in the usual manner. I also place a single lap on the other halves of the upper and lower panes in the same manner, and leave an aperture between the ends of the laps in the centre of the panes, as at *e*, fig. 2. The half of the pane I cut so as to form an angle in the centre, as shewn. Hence the water or steam which forms or is condensed on the under side of the glass, is conveyed along the pane to the lap, and is there on each side carried along the centre groove or cavity in the lap to the aperture, and descends on the pane below. Thus it proceeds from pane to pane, along this groove or cavity, and through the aperture from the top of the lights to the spout or gutter, and does not fall within the house."

The patentee claims the adaptation of his invention to window frames of all sizes, and made of all kinds of metal, but in what the invention consists, we do not perceive.

[*Inrolled, August,* 1824.]

To JOHN LEIGH BRADBURY, *of Manchester, in the County of Lancaster, Calico Printer, for his Invention of an Improvement in the Art of Printing, Painting or Staining Silk, Cotton, Woollen and other Cloths; and Paper, Parchment, Vellum, Leather, and other substances, by means of Blocks or Surface Printing.*

[Sealed 15th July, 1823.]

THIS invention is stated to consist, first, of a new description of table, on which the blocks for printing are to be laid; and secondly, in a new arrangement of the blocks. These novelties appear to be simply the introduction of fixed points of metal in the table, and of corresponding holes in the respective blocks which the points are to pass into, for the purpose of fixing the block at every impression, exactly in the same position, that the several impressions given in succession may perfectly accord; or, as it is termed, register. There does not appear from the specification to be any thing new in the form or construction of the table or blocks, excepting the fixed points in the former, and the corresponding holes in the latter. It is stated that these improvements may be adapted to any description of printing press, whether constructed with rollers or not, and whether worked by hand or by machinery. Such as gear connected to a steam-engine, or any other first mover, in the manner that the rollers and blocks of calico-printing, and paper-staining presses, are sometimes actuated.

[*Inrolled, January,* 1824.]

To JOSEPH WELLS, *of Manchester, in the County Palatine of Lancaster, Silk and Cotton Manufacturer, for his new invented Machine for Dressing, and Stiffening and Drying, of Cotton and Linen Warps, or any other Warps that may require it, at the same time the Loom is working, either with the motion of the Loom or any other Machinery.*

[Sealed 25th May, 1824.]

THIS invention is a certain combination of machinery, consisting of rollers, brushes, and a fan, to be adapted to looms in general, for the purpose of communicating stiffening matter to warps, and of drying the same in the loom as the process of weaving goes on. Plate X. Fig. 3, is an end view of a hand-loom, or what is more commonly called, a dandy loom, the toothed wheels for drawing off the work being omitted in order to shew the improved parts more plainly; *a*, is the roller or warp beam, from whence the warp is delivered; at *b*, a reed is placed, through which the warp is passed for the purpose of separating the threads; *c*, is a roller extending along the back part of the loom; and *d*, is a similar roller, partly immersed in the trough *e*, containing size. Between these two rollers the warp passes, and by that means receives the liquid stiffening matter from the lower roller, while the upper roller, by pressing it, squeezes away that which is superfluous. The pressure of the upper roller against the lower one may be effected by springs or weighted levers bearing upon its axles.

From these rollers, the warp proceeds through the reed of the batten *f*, and thence over the breast *g*, to the work roller *h*. In order to prevent the threads of the

warp from adhering together, rotatory brushes, *i i*, are introduced, which sweep the warp as they go round. These brushes are made to revolve by the agency of a compound lever, *k k k*, which has its fulcrum at *l*, and is connected to the upper part or sword of the batten. As the batten swings backwards and forwards in beating up the weft, at every stroke the compound lever is made to rise and fall, and having at its reverse end a catch, which takes into the teeth of a rachet wheel *m*, upon the axle of the revolving brushes, these brushes are by that means progressively driven round, and by brushing the warp as they pass, separate the threads.

To assist in drying the stiffening matter upon the warp, a vibrating fan, *n*, is put in motion. This is done by attaching two rods or cords to the end of a cross lever, at the bottom of the vibrating fan, and connecting the rods or cords to the treadles *p p*. Thus, as the treadles which move the leashes pass rapidly up and down by the action of the feet of the weaver, the fan is made to vibrate, and produce a current or circulation of the air, which considerably assists in drying the warp.

In a similar way, the same object may be effected in any other description of loom, as those worked by steam, or other power. The patentee does not claim any improvement in the loom itself, but confines his invention to "applying, and putting in motion certain rollers, brushes, and a fan, to looms for weaving, whereby the united effects of dressing, stiffening, and drying cotton and linen warp, or any other description of warps, are produced at the same time that the loom is working; by which invention, great saving will be found by dressing, stiffening, and drying the warp whilst in the operation of weaving."

[*Inrolled, November*, 1824.]

To HENRY CONSTANTINE JENNINGS, *of Devonshire-street, in the Parish of St. Mary-le-bonne, in the County of Middlesex, Esq. for his Invention of an Instrument to be affixed to the Saddle-tree, by the application and use of which, inconvenience and distress to the Horse may be avoided.*

[Sealed, 11th September, 1823.]

THIS instrument is for preventing inconvenience and distress to a saddle-horse when travelling, and consists of a pair of springs affixed to the saddle-tree, which are to be applied to the horse's sides under the girths: the design of which is, that the force of the springs acting outwardly, shall prevent the girths from pressing the sides of the horse, and by that means afford relief to the natural expansion of the body in the act of breathing. The adaptation of this invention is claimed by the patentee in every way that it may be varied to effect the object; that is, in all the modes by which springs may be attached or applied to saddle-trees, so as to prevent the girths from pressing the sides of the horse.

In plate X. is one method of carrying this invention into effect. Fig. 4, is a view looking down upon the saddle-tree; *a a a*, is the wood work; *b b*, the springs attached to it; these springs are made of flat slips of thin steel, with broad ends, or cross pieces affixed to their ends; a section of the form of the spring is shewn at fig. 5. There are staples, *c c*, attached to the sides of the saddle-tree, upon which the recess at the upper part of the spring rest, and the upper extremity of the spring passes under the saddle-tree, by which it is confined.

These springs may be composed of one, two, or more

slips of steel, as may be found necessary, according to the required strength, allowing the springs to play freely; and it is desirable, after the steel has been properly prepared, that it should be varnished, to prevent damp or the perspiration of the horse from rusting it. The springs should be closed in cases or sheaths of hempen webbing, to guard against their rubbing the leather.

The girths are so attached, that they pass over these springs when buckled, and thereby bind the springs to the form of the horse's body; but by the outward force they constantly exert in endeavouring to recover their straight form, they will have a tendency to relieve the side-pressure on the ribs of the animal, instead of confining him, as by the ordinary pressure of the girth.

[*Inrolled, March,* 1824.]

To JOSEPH BOURNE, *of Derby, in the County of Derby, Stone Bottle Manufacturer, for his Invention of certain Improvements in the Burning of Stone Wares, and Brown Wares, in Kilns or Ovens, by carrying up the Heat and Flame from the Furnace or Flue below, to the middle or upper parts of the Kiln or Oven, either by means of Flues or Chimneys in the sides thereof, or by moveable Pipes or Conductors, to be placed within such Kilns or Ovens; and also by increasing the Heat in Kilns or Ovens, by the construction of additional Furnaces or Fires at the sides thereof, and to communicate with the centre or upper part of such Kilns or Ovens,; and also by conveying the Flame and Heat of one Kiln into another or others, by means of Chim-*

neys or Flues, and thus permitting the Draft and Smoke of several Kilns or Ovens to escape through the Chimneys of a central Kiln or Oven of great elevation, whereby the degree of Heat is increased in the several Kilns or Ovens, and the quantity of Smoke diminished.

[Sealed, 22d November, 1823.]

By the statement of the patentee in this specification, an inconvenience appears to have been found in the pottery kilns or ovens of the present construction; viz. that by applying the fire at bottom, the articles to be baked in the lower part of the kiln became injured by burning, while those in the upper part of the kiln were not sufficiently acted upon by the fire. To remedy these inconveniences and defects in the articles of pottery so baked, the present invention is proposed, which consists, first, in conducting the heat from the furnace below to the upper part of the kiln, both by flues proceeding laterally from the furnace, and also by tubes or conductors, which may be placed so as to pass up the middle of the kiln from the furnaces; secondly, in additional furnaces placed on the sides of the ovens, with flues leading therefrom passing into the ovens; and, thirdly, in conducting the flame and heat of the furnaces from one kiln to another, and causing the draft of the several kilns connected together to meet in the centre kiln, and the smoke to pass off at one chimney.

Plate XI. fig. 3, represents a vertical section of three connected kilns, for burning or baking pottery wares: *a a a*, is the central kiln, with bricked arches across, for the purpose of giving strength to the walls; *b b*, are the furnaces below, by which the heat is communicated to the bottom of the kilns as in the old way; *c c*, are lateral

flues, of which there are a series on each side, for the purpose of causing the heat from the furnaces to pass into the kiln at some distance from the bottom; *d d d d*, are other kilns erected on the sides of the central kiln, in the lower parts of which will be seen tubes or conductors, *e e*, made of fire stone, any number of which tubes may be made to extend from the furnaces some distance up into the kilns, for the purpose of bringing the fire to act more directly and with greater force upon the interior of the kiln, than it would be capable of doing if the heat passed from the bottom through the articles while baking. These tubes or conductors are made of different lengths, and capable of being shifted, to accommodate the force of the fire to occasional circumstances.

Additional furnaces, *f f f f f f*, are constructed on the sides of the kilns some distance up, for the purpose of increasing the heat; from these furnaces a series of lateral openings, on each side, lead into the kilns or ovens, and the fuel for feeding these additional furnaces is to be supplied from a ledge or plate on the outside of the kiln.

From the tops of the ovens, *d d*, flues, *g g*, proceed into the upper part of the central oven, *a*. By these means the flues of any number of kilns or ovens, built round a central kiln, or side by side, of different heights, may be conducted into one general flue or chimney, and the heat of the several kilns or ovens will thereby be greatly increased, and the smoke and other vapours in a great measure consumed.

On the sides of the kilns buttresses, *h h*, are proposed to be erected for giving strength and support to the brick-work, and the top of the kiln may be held together by the tie bars, *i*, made of wrought iron.

[*Inrolled, January,* 1824.]

To Josiah Parkes, of Manchester, in the County Palatine of Lancaster, Civil Engineer, for his Invention of a certain Method of Manufacturing Salt.

[Sealed 4th December, 1823.]

THE method of manufacturing salt herein described, is by evaporating brine in a boiler, as heretofore practised, but the particular apparatus proposed to be employed by the patentee for that purpose, differs considerably from the evaporating pans or boilers at present in use. The object of this invention is to afford the means of withdrawing the concentrated salt from the boiler or pan, without stopping the process of evaporation, and for this purpose a covered boiler is constructed of the shape, and with the appendages, exhibited in the section, Plate X. Fig. 10.

The brine is introduced into the boiler *a*, by means of the pipe, *b*, leading from a reservoir and passing through the lateral tubes and stop-cocks *c c*. The furnace is at *d*, from which the flame of the fire proceeds round the flues *e e*, which circumscribe the lower part of the boiler. The lower stop-cock *c* being closed, and the upper one partially opened, the brine is made to boil, and the steam evaporated, after rising in the dome of the boiler, passes off through pipes at *f*, and the diminution of the brine is supplied by the upper cock *c*, as the process goes on. The lower part of the boiler at *g* is made cylindrical, and being below the fire, is somewhat cooler than the upper part: as the brine boils and the water evaporates, a concentration of the salt takes place, which falling down, deposits itself in the lower cylindrical chamber at *g*.

After boiling the brine for about one hour, the concentrated salt is in general found to have sufficiently de-

posited itself to require removal; in doing this, the lower stop-cock *c* is first to be opened, for a short space of time, and a current of cold brine allowed to flow in at the lower part of the boiler, by which the whole is disturbed, and the concentration further promoted. The lower cock *c* being again closed, and time allowed for the descent of the salt into the cylindrical chamber *g*, the cock *h* attached to the lower conical part of the chamber is to be opened, and the salt allowed to flow through the aperture, which should be received into a basket or strainer. After the salt is discharged, the cock *h* must be shut again, and the process allowed to go on as before for about another hour.

One hour is stated as the probable space of time in which a sufficient concentration of the salt in a boiler full of brine will take place; this, however, will depend upon the dimensions of the boiler, and upon the heat applied. The patentee does not confine himself to the employment of a furnace and flues as shewn surrounding the boiler; steam may be employed as the heating matter, which, under some circumstances, will be found advantageous, and even preferable to fire, acting immediately against the surface of the boiler, as then the salt cannot burn. This steam may be conducted by pipes from the boiler or steam engine to a chamber surrounding the evaporating vessel; or if several vessels are employed of the kind above described, the steam driven off from the first, as at *f*, may be conducted to the next evaporator, and so on. A similar apparatus may be advantageously employed for the concentration and crystallization of sugar, and other substances held in solution.

[*Inrolled, August,* 1824.]

To Benjamin Agar Day, *of Birmingham, in the County of Warwick, Fire-screen Maker, for his Invention of certain Improvements in the Manufacturing of Drawer, Door, and Lock Knobs, and Knobs of every description.*

[Sealed 15th June, 1824.]

The patentee proposes to make the knobs for drawers, doors, and furniture generally, by attaching together two or more pieces of cast or wrought iron, of such a shape as will produce, when so combined, the desired figure of the knob. These iron models are to be covered with thin plate metal, by which means the knobs will be rendered durable, and have the appearance of solid brass, or other solid metal. The rose parts, or caps, that is such as are chased on the face, are proposed to be stamped or pressed out of plate iron in a heated state, which caps or roses are to be attached to the shank of the knob previously formed by means of screws or rivets, and the coating of thin plate brass, or other metal, pressed on and bent over the edges of the iron.

In a similar way rims or other ornaments of silver, brass, and other metals, may be attached to ebony or other wooden knobs, by making the shank of metal pass through the wood, which is proposed to be fastened to it by nuts or otherwise, at the discretion of the workman.

[*Inrolled, August,* 1824.]

To WILLIAM BAILEY *the younger, of Lane End, Staffordshire Potteries, Manufacturer and Ornamenter of Lustre-ware, for his Invention of an Improved Gas Consumer for the more effectually consuming Smoke arising from Gas Burners or Lamps.*

[Sealed 15th June, 1824.]

THE subject of this patent is a hollow globe with a trumpet-mouth, to be suspended over a gas-burner for the purpose of receiving the smoke and other vapours emitted in the combustion of the gas. Such an apparatus was described in our second volume, as *Debaufer's Perdifume*, and the present does not appear to differ in form from that alluded to; but the invention which constitutes the subject of the present patent, consists in making these perdifumes of porcelain instead of metal as heretofore.

The patentee forms a hollow globe of porcelain, and attaches to its aperture a conical or trumpet-mouthed chimney of the same material. It is directed that the inside of the globe shall not be glazed, which is designed to prevent it from cracking when suddenly heated by the flame of the gas. The conical or trumpet-mouthed chimney is to be about nine inches long, and not more than half an inch wide at the top or contracted part entering the globe, by which it is considered that the smoke and vapour emitted from the combustion will, in ascending, be drawn into this narrow opening, and be there burnt by the concentrated heat of the flame.

The inside of the porcelain cone or trumpet-mouthed chimney is to be glazed with platina, for the purpose of producing a reflector that shall throw the light down, and which will not be likely to tarnish by the corrosive emanation from the gas,

as the polished surfaces of metal reflectors generally do. The outsides of these porcelain perdifumes are proposed to be ornamented with various colours and burnished gold, forming elegantly devised subjects, painted in the manner of china painting, or decorated with figures in bas-relief, as vases and other elegant china ornaments are made.

[*Inrolled, August,* 1824.]

To John Turner, *of Birmingham, in the County of Warwick, Brass and Iron Founder, for his Invention of a Machine for Crimping, Pleating, and Goffering Linens, Muslins, Frills, and other articles.*

[Sealed 27th April, 1824.]

The crimping or goffering of muslin frills and such other articles as required to be got up in the laundry with small pleats, have been commonly done by placing the article to be pleated upon a small square piece of wood cut into indentations on the upper side, and pressing the muslin into those indentations by means of a roller cut in a similar way along its periphery. This operation, however, being performed without the aid of heat, the crimping was very imperfectly produced, and had but little durability. From these considerations the patentee has been induced to construct an apparatus by which the crimping of muslins, &c. may be performed upon a heated block, so that the indentations may remain upon the muslin with the same durability that pleats and folds remain which are formed by hot smoothing irons.

The present invention is a box or hollow block of iron

or brass indented on the upper side, in the interior of which a heater is to be placed similar to the heaters of ordinary box-irons; a cylindrical roller of metal is also to be employed with indentations extending along its periphery, corresponding to the indentations of the top plate of the box or hollow block, which roller is mounted upon an axle in a carriage. The article of muslin or other material about to be crimped is to be laid upon the indented surface of the heated box in a somewhat damp state, and the roller passed over it, by which means the crimping of the muslin will be effected and rendered stable by the heat of the plate drying the muslin, as in ordinary ironing, in the form of the indentations of the plate and roller.

No particular dimensions are stated, and the material of which the box and roller are to be made, may be iron, brass, or any suitable metal, the invention consisting entirely in adapting a heater to a crimping bed for the purpose above described.

[*Inrolled, June*, 1824.]

Original Communication.

To the Editor of the London Journal of Arts, &c.

SIR,

AT a period when the attention of the public seems so earnestly, and almost exclusively devoted to the search after some means of performing their locomotions without the aid of animal force, every hint, however humble, tending to aid the accomplishment of that object may, perhaps, be considered serviceable; with that view, I beg to offer a

few observations, which, when placed in the hands of those who can afford more time for such subjects than myself, may possibly be productive of substantial effects.

In every vehicle which has hitherto been propelled by machinery, whether a huge coal waggon on railway, or an invalid's chaise in a park, the prime force has always been employed to *turn the wheels upon which the carriage runs:* but it must be evident, upon the most casual reflection, that to obtain a progressive motion, mechanical powers could scarcely be applied at a greater disadvantage. In the first place, there is an immense loss of power by *leverage*. 2nd. Great weight cannot be propelled at all on a *level* and *smooth* railway, or the common roads; the friction of the surface of the wheel and that of the road or railway not giving sufficient resistance to produce progression, a cogged wheel railway becomes requisite, which presents an insurmountable barrier to the attainment of any considerable velocity. And 3rd, the machinery thus applied has been found insufficient to carry the vehicle up ascents of any great elevation, and *fixed* engines, besides the locomotive, must be resorted to. Notwithstanding all these objections, great and invincible as they are, men seem to have directed their every idea to the improvement of this solitary plan, without a thought that they might possibly find a shorter and more facile road to the bourn of their desires. To shew, however, that there are many untried ways inviting their attention, I need only ask them to consider for a moment the very different effects produced by the *pulling* of a horse and the mere *turning* the fore or hind wheels to give motion to a carriage. Although it would not always be wise to follow implicitly the mechanism of nature in works of art, yet we may not unfrequently derive valuable hints from observing, and sometimes imitating, her

ways; and in the present instance we shall find our account in so doing.

In the progression of all four-footed animals the fore legs are never employed to *propel* the body, but merely as a *support* whilst the hind legs, whose exclusive office it is, project or push it forward; thence in all animals of great fleetness or capable of *drawing* great weights, we find the hind legs invariably the strongest. The motion is performed by first raising the body and throwing the centre of gravity forward, and then *pushing out* the hind legs with all the force of the muscles. In traction the horse will sometimes *pull* with the fore legs, but with little effect, by far the greatest being produced by this thrusting out of the hind legs. There is, indeed, pretty nearly the same principle in the locomotion of all animals, even of man himself, and it may with facility and effect be adopted in machinery. Let a man place himself on a small carriage, running upon wheels, and propel himself by a stick in either hand pushed out behind alternately, he will find that he can travel with far greater velocity than he could walk, or that he can transport even more than his own weight with the same ease that he could walk; and if mechanism be applied to these propelling sticks, so that the power of his legs can be sufficiently exerted, he will find that he will be able to continue the labour with as little fatigue as he could walk, and for as long a time. It is such mechanism as this that I propose to apply to carriages to run, either upon the plain roads or upon trams, and to be actuated by steam or other power. I will not enter into the details of the machinery best adapted to give motion to the propellers, but confine myself to the illustration of an idea in its most simple form.

Let A B, Plate XI. figs. 4 and 5, be a rod traversing transversely through the nut C, which has an axis of its own,

and let E D A be a lever having a fulcrum at D, and a joint at A, by which it is connected with the rod A B. Now if the arm E be raised by a force in the carriage, it will depress the rod A B, and give a progressive motion to the vehicle. *a b*, represents the position of one of the rods depressed to its full extent, and ready to be drawn up as the other descends; the effective power will of course vary with the angle which A B forms with the horizon; or if A B acted in the horizontal line as A x, the whole force exerted would be effective to propel the carriage; but it is necessary to obtain a secure holdfast in the road, that it should not be too much inclined; for the present we will assume 45°. Then if we take A B to represent the force expressed, we have A x the effective force in the required direction, for A B is composed of A x, x B, of which x B acts in the direction of gravity; and in this instance the angle B A x being $= 45°$, A $x = x$ B, it would be easy and would require but very simple machinery to work several sets of these rods acting alternately, by which means *any velocity* may be attained. The construction offers so many methods of varying the power as occasion may require, that no difficulty would be found in ascending hills. On a railway (constructed on the beautiful principles of Mr. Palmer's, or similarly) the advantages would be very great, for the power might be made to act horizontally. It may be objected that it would injure the common roads; but as each rod need act with no more force than a horse's leg, and need be no sharper than that animal's hoof, it is evident that it would do no more damage. The light-horse coaches, which run at the rate of ten or twelve miles an hour, weigh, *unloaded*, from 18 to 22 cwt.; with the ordinary proportion of passengers and luggage, they will perhaps weigh two tons: a ten horse-power steam engine (equal to ten *coach*-horses) weighs under five tons, and by working it against the at-

mosphere, this might be considerably reduced; we may, therefore, reasonably expect it to move at the same, if not at a greater velocity. These, Sir, are the outlines of the principles to which I wish to direct the attention of those who have leisure for the consideration of them. I have delayed the communication in the hope that I might be able to demonstrate it more fully by a model, but as my avocations seem still likely to intervene, I am fain to leave the subject to such of your readers as may be more able mechanicians than,

Sir, your most obedient Servant,

B.

London, March, 1284.

We give insertion to the above communication because the principles of the mechanical agency there described, as applied to the locomotive carriages, appear to deserve attention, particularly at the present time, as the subject of locomotion now forms the leading feature of mechanical enquiry. Our correspondent, however, does not appear to be aware that mechanical action upon the same principle, has been before applied to steam carriages on rail roads. Brunton's locomotive engine, or Iron Horse, as it is commonly called, is upon a similar plan; so also is one of the modes of propelling boats on shallow rivers and canals, proposed in Scott's patent, granted about seven years ago: and in our first vol. page 254, will be seen Baynes's patent for "*certain machinery to be applied to carriages, for giving them motion;*" which last mentioned invention was adapted to an elegant vehicle, and certainly did appear to answer its intended purpose; but the patentee being engaged in other pursuits, has not, that we are aware of, put the invention forward to public notice.—EDITOR.

Novel Inventions.

Model of the City of Paris.

In our sixth vol. we took occasion to express our opinion of topographical models, when speaking of a map in relief of the Holy Land, then, and still exhibiting in London; we have now to notice a somewhat similar work of art, but one, certainly, possessing greater attractions and claims on public patronage—no less than the extraordinary task of representing the whole City of Paris in miniature! This model or map in relief is upon a scale of about sixty feet to the inch; consequently it is sufficiently large to admit of representing the features of every house in Paris. We do not mean to say that is literally accomplished in the model, but, certainly, we have had much pleasure in pointing out the respective residences of our friends in that city, and can bear testimony to the general accuracy with which the whole has been depicted. Those who are acquainted with Paris will be highly gratified by an hour's lounge at this exhibition, and may imagine themselves tracing the course of the Seine, or of the streets, from the top of the column in Place Vendome, the Pantheon, or some other elevated part of the city. The work, which is said to have been fifteen years in completing, certainly does great credit to the ingenuity and perseverance of the artist who made it, and will, no doubt, from the number of visitors that daily attend, amply remunerate the proprietors.

New invented Life Preserver for Descending Mines filled with Foul Air, and entering Houses on Fire.

An humble individual named Roberts, a miner, has lately exhibited a new invented apparatus in London, by which he is enabled to enter places filled with deleterious vapours; such as houses on fire, or mines occupied with carbonic acid gas. Not finding any convenient place to exhibit his experiments, he applied to the Mechanics' Institution, where he was at length accommodated by the erection of a temporary building. The place appropriated for the experiment was a closed room, in which a quantity of wet hay, shavings, and wood were set fire to, and with this about two pounds of sulphur was burnt, so as to produce an exceedingly dense smoke and fume, sufficient to extinguish animal life.

Into the room, in this suffocating state, the man entered, having previously attached his apparatus to his person, which consisted of a sort of helmet or box, with glazed apertures for the eyes, and the opening of a pipe or tube opposite the mouth, which tube descended nearly to the ground. At the outer end of this tube, a piece of sponge was introduced so as to close the orifice, and permit no air to pass to the mouth of the man, except through the sponge.

The temperature of the room was raised by the fire within, as appeared by the thermometer, from 68 to 115 degrees, and in this heated and deteriorated atmosphere, he remained more than half an hour, occasionally wetting the sponge at the end of his air tube, by which means it appeared that the air in passing the sponge, became so much filtered and purified, as to support animal respiration without difficulty. This is a singular fact, but is beyond doubt, because the state of the atmosphere within

the room, was such as to extinguish the candle a few minutes after he entered, and ultimately to melt it. An opinion seemed to prevail, that the water in the sponge gave out a sufficient quantity of oxygen to support the life of the operator. He came out of the room with but little appearance of exhaustion, though certainly perspiring copiously, and his pulse at that time appeared to give 174 beats per minute.

Roberts is a young man, perhaps about thirty, has followed the profession of a miner from his childhood, has no fear of going into any unhealthy mine with his apparatus, and would undertake to open a passage where the vapour could not support life. We understand that Lord Lindsay, and Dr. Henry, of Manchester, are his patrons, and that the plan will shortly be submitted to trial by some other persons under variable circumstances, in order to ascertain how far it may be employed with benefit to the public.

Improved Method of Embossing Wood, invented by Mr. Streaker, of Red Cross Square, Cripplegate.

Raised figures on wood, such as are employed in picture frames and other articles of ornamental cabinet work, are usually produced by means of carving, or by casting the pattern in plaster of Paris or other composition, and cementing or otherwise fixing it on the surface of the wood. The former mode is expensive; the latter is inapplicable on many occasions. The invention of Mr. Streaker may be used either by itself or in aid of carving; and depends on the fact, that if a depression be made by a blunt instrument on the surface of the wood, such

depressed part will again rise to its original level by subsequent immersion in water.

The wood to be ornamented having first been worked out to its proposed shape, is in a state to receive the drawing of the pattern; this being put on, a blunt steel tool, or burnisher, or die, is to be applied successively to all those parts of the pattern intended to be in relief, and at the same time is to be driven very cautiously, without breaking the grain of the wood, till the depth of the depression is equal to the intended prominence of the figures. The ground is then to be reduced by planing or fileing to the level of the depressed part; after which, the piece of wood being placed in water, either hot or cold, the part previously depressed will rise to its former height, and will then form an embossed pattern, which may be finished by the usual operations of carving.

For this invention the Society of Arts have voted to Mr. Straker their Silver Isis Medal and Ten Guineas

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Polytechnic and Scientific Intelligence.

Royal Society.

February 24.—Dr. John Richardson, and Henry Green, Esq. were elected fellows.

March 3.—Dr. John Lewis Tiarks was elected a fellow, and a paper on the maternal fœtal circulation, by Dr. David Williams, was read. The object of this paper is to prove, that the maternal and fœtal systems are only parts of one

common and uninterrupted sanguiferous system, for which purpose the author details several experiments on bitches far gone with pup, into the arterial system of which animals, after suffocating or pithing them, he injected warm olive oil. He then opened the uterus, removed the pups, and examined the fœtal blood by rubbing it on paper, or receiving it in warm water. The result was, that in some instances films of oil were discovered, but in others no such appearance was observed.

A paper by Dr. James Rawlins Johnson was also read, containing some further observations on the genus planariæ.

Mr. Dalzell, in his account of some species of this curious insect, states, that having unintentionally wounded one of them just below the head, an excrescence soon appeared at the wounded part, and in about four weeks it became a complete head. With a view of repeating the experiment, Dr. Johnson took 100 active planariæ cornutæ, and made a similar incision in each of them, but in only one instance did he obtain a like result.

Dr. Johnson also found, from repeated experiments on the planariæ cornutæ, that the detached fragments of this singular animal were always most rapidly reproductive when kept singly; hence he infers, that the regenerative process is voluntary.

March 10.—Joseph Henry Green, Esq. was admitted, and Major-General Sir Benjamin D'Urban, elected a Fellow of the Society.

A paper describing some improvements on Leslie's photometer, by the Rev. Wm. Ritchie was read,—

This improvement consists in substituting a thick bulb of transparent glass, blackened on the inside with a mixture of China ink and water, and a little sugar, in the place of the black enamelled bulb of Leslie's construction. By this means, the absorption of heat takes place at the inte-

rior instead of the exterior surface of the black ball, and the heat is thereby not so liable to be carried off by radiation, or by the conducting power of the surrounding air.

Mr. Ritchie concludes his paper with the extract of a letter to him from Mr. Herschel, on the principle of Mr. Leslie's photometer, in which he describes a method of measuring the absolute momentary effects of the solar radiation; and details several experiments which he made with that instrument in the island of Sicily, under various circumstances, and at different elevations.

March 17.—A paper on the influence of nerves and ganglions, in producing animal heat, by Sir Everard Home, was read,—

After observing, that although there are animals possessing both brain and nerves, such as the snail, the water-muscle, and the oyster, which seem destitute of the power of generating heat, yet wherever this power is found to exist, nerves are also found in great abundance; and to prove this connection, he relates the following experiment:—The heat of a deer's horns, whilst enclosed in its velvet, was found to be 96°; this was in the month of June, when the horn was only one foot in length. In the following month, at the top of the antler, it was 99°; here was an evident power of generating heat at a point far removed from the brain and heart. On examination, it was ascertained that nerves did accompany the blood vessels in great abundance; and to determine whether the animal heat was under their controul, the trunks supplying the velvet of one horn were divided, whilst those of the other were left uninjured. On the day after the operation, the temperature of the former had sunk to 12° below that of the latter; and on the second day, 26°, the temperature of the injured horn being then only 3° degrees above that of the atmosphere. After this, the temperature encreased, probably from some connection

having taken place between the nerves of the horn and head, though the nervous trunk itself had not then re-united.

The author then remarks, that having observed the abundant connection of the placental nerves with the ganglia, he was led to suspect that the uterus, under certain circumstances, might possess extraordinary powers of generating heat; which, on enquiry, he found to be the case; and that instances had occurred of the heat in that part rising so high as 120° during the violence of the pains in difficult labours. He hints also, that the ganglionic nerves are probably those which are principally affected in diseases, accompanied by heat much above the natural standard.

March 24—A paper was read containing results of Meteorological Observations, taken at the Madras Observatory, by John Goldingham, Esq. These observations, which commence with the year 1796 and conclude with 1823, prove a very regular diurnal variation of the barometer in tropical climates. It appears that the weight of the atmosphere is at its maximum, at 10 A. M. decreasing from that time till 5 P. M. when it begins to regain a part of what it had lost in weight, from the action of the sun's rays. By 11 P. M. it is nearly, though not quite so heavy as in the forenoon—its weight then gradually diminishes, as in the day, though not in so great a degree, till about two hours before sun-rise, when the weight begins again to decrease. The author infers from these observations, that the moon has but little influence on our atmosphere.

The rest of this paper contains some curious remarks on the seasons and monsoons at Madras. The average quantity of rain, in the course of a year, is about 50 inches, upward of 45 of which appear to fall during storms.

The Society then adjourned over the Easter Holidays.

SOCIETY OF ARTS.

SINCE our last notice of this Society their respective Committees have been actively engaged in the examination of Inventions sent to the Society, for honorary or pecuniary rewards; the following are the subjects which have been investigated and reported upon.

Committee of Mechanics.

Improvements in the mechanism of steam engines, in which the valves are opened by bevel gear, instead of the ordinary crank movements: —Fire-balls, that is, a substitute for coal or other fuel, made by a composition of cow-dung, saw-dust, and small coal :—A key for the locks of street doors, which cannot be moved by any instrument on the outside of the door:—Safe coaches, having guards or props to support them in case of overturning :—A pump, the rising main of which is formed into several combined syphons :—An air bed made by a series of long bags filled with air :—Improvements in lenses for optical purpose, in which the refraction is proposed to be corrected by combining several pieces of glass to form one lens :—A spirit level, in which a perpendicular bar is acted upon by the flow of mercury in the horizontal tube; this bar is intended to be employed instead of the ordinary plumb line :—A magnetical apparatus, for extracting small particles of steel from the eyes of persons employed in pointing of needles and other dry grinders of iron and steel :—A window, turning over to prevent accidents in cleaning :—A fire escape, consisting of a rope, to be attached to a staple previously fixed in the ceiling of the room, and when a fire occurs the rope is to be made fast to the staple, from

whence it is to descend to the opposite house, forming an inclined plane for a chair, containing one or two persons, to be passed down; the mode of regulating the descent being by a check rope, traversed through a sheave or pulley block:—A mode of raising bricks, mortar, and other articles to the top of a scaffold, to prevent the necessity of carrying them up ladders. A centrifugal governor for a crane:—A guard for a lock, consisting of a scutcheon to cover the key-hole, which is fixed or moved by a secret bolt, worked upon the shifting letter principle:—A safety valve for a steam engine, consisting of a piston packed in a small cylinder open to the boiler, which piston is kept down by a spiral spring of a power equal to the pressure at which the engine is intended to work; upon the force of the steam exceeding that point, the piston will be raised, and the steam escape through an opening in the side of the small cylinder, near its top: —A pump bucket, the valves of which are of metal, with bevelled edges, instead of leather:—A fire escape, consisting of a high pole set in the top of an engine, to which a lever is attached, having a bucket at the end, to be raised to the windows of the house on fire:—Iron ties to be employed in buildings, as auxiliaries in the framing of timbers, truss girders, and roofs of large span:—Improved dock gates, constructed at Devonport: —A fire escape consisting of a carriage with a mast in the middle, to which a cross arm is attached and drawn up by ropes and pulley blocks, at the end of the arm a chair is suspended, to be let up and down by a rope and pulley:—Safe coaches, in which the centre of gravity moves as the wheels pass rapidly round a corner:—Improvements to aid in the sailing of ships, by additions to the keel and rudder:—A fire escape, consisting of a trough with steps on the inside, which may be moved

from the side of a house by joints and placed to a window, whereby persons can descend:—A safety valve for a steam engine, in which the plug of the valve is stationary, but the seat is enabled to recede from it, and open the valve, by the bending up of the plate in which the seat is fixed, as the force of the steam increases:—A bridge of tension and suspension, constructed of ropes and canes, which may be put up or taken down in a few hours; the model exhibited a fac-simile of one made for passing rapids in the East Indies:—Folding chairs, put together by hinge joints, which pack in a small compass, and are peculiarly adapted for camp equipage or for shipping:—A system of gymnastic exercise for giving freedom and agility to the bodies of young persons:—A method of ventilating ships, by means of tubes which pass from the lower parts up to the deck, and over the sides of the vessel down to the water's edge; the unpulations of the waves causing the water to rise occasionally in the pipes, and again receding keeps up a continual air pump, which draws the foul air from the lower parts of the vessel:— The stand of a table for drawing large plans or architectural designs, by which the table is rendered capable of being raised to various heights, and of turning in every direction, as well as being inclined at different angles to the horizon:—A cooking apparatus, with boilers, steamers, oven, &c. the fire being in the middle, and the flues passing through between the several compartments:—A new mode of supporting the centering of arches of bridges and other erections:—A water wheel, which turns horizontally on a vertical axle, having float boards attached by hinges to the sides of the cross arms, so that they have a bearing and resistance against the arms on one side, as the wheel revolves, and float freely on the

other :—An improved wooden-leg, the socket of which is made of metal, to give stability, instead of leather as heretofore :—An instrument of an improved construction for drawing teeth :—Surgical instruments of several kinds, and for various purposes :—Methods of adopting a lever, so as to afford the means of shipping and unshipping anchors and heavy cannon :—Stages, round vessels, for the purpose of repairing their outsides :—Coffers for repairing ships below water :—Improvements in ship-building : —Floating leaky vessels, by means of air-bags on the sides, from which ropes pass under the ship's bottom, and by drawing the ropes tight, the hull is raised in the water :—Timber for stern rails :—Tubes of an improved kind for barometers, and other philosophical purposes :— A portable stand for a telescope :—A carpenter's smoothing plane, for reducing rough timber :—A sextant :—A portable mill, to grind corn and other grain, by means of steel cutters, indented like bur-stones :—A method of opening ships' ports at sea.

Committee of Chemistry.

Method of making glue from fish skins :—Hardening wood for naval and other purposes :—Illuminating a solar microscope, by throwing the light of Gurney's improved blow-pipe on lime, which produces a more intense light than can be obtained by any other chemical means :— Leather made from the skins of skait fish :—Experiments on the analysis of British and foreign opium :—Preparation of rose leaves, for medicinal purposes :—An improved Saccharometer :—Crucibles for melting metals that will not crack by variations of temperature :—Indelible ink.

Committee of Agriculture.

Improving waste land :—Substitute for the Leghorn plat of Lombard, and Tuscany :—Seed raised from American grass, used for platting hats and bonnets.

Committee of Manufacture.

Various specimens of platted grass bonnets and hats, in imitation of Leghorn, presented from different parts of England.

MECHANICS' INSTITUTION.

A new Institution for promoting mechanical knowledge, has been formed at Bethnal Green, for the purpose of instructing operative weavers of that neighbourhood. The first meeting took place on Thursday, 10th March, at a chapel in Church-street, Bethnal Green, when Dr. Birkbeck was requested to preside; a very numerous audience attended, to whom the chairman represented the great advantages likely to result from a study of mechanics, particularly to the practical weaver: he also alluded to the ingenuity which he knew to prevail among the lower classes in that part of London, and complimented them upon several valuable collections of natural curiosities, which had been formed by their industry alone. After the introductory speech, a lecture on the elements of mechanical science was delivered by Mr. Partington, sub. lib. to the London Institution; and subsequently two other lectures have been delivered, as a continuation of the subject, by the same gentleman. Numbers of the operative class of weavers are attaching themselves to the new institution, which is greatly promoted and sup-

ported by the wealthy master weavers of that neighbourhood. It is not yet determined whether this shall be a distinct society, or an auxiliary society to the Mechanics' Institution already formed. There is no doubt but that this society, if properly conducted, will be more conducive to the improvement of British arts and manufactures, than any other institution, which has, or may be, formed in any other part of the kingdom.

ASTRONOMICAL SOCIETY OF LONDON.

March 11.—There was read "An Account of the Arrival and Erection of Fraunhofer's large Refracting Telescope at the Observatory of the Imperial University at Dorpat," communicated in a letter from Prof. Struve to Francis Baily, Esq. president. Prof. Struve received this telescope in November last, and was happy to find that although it had travelled more than 300 German miles, its several parts had been so carefully packed that none of them had sustained the slightest injury. When in a perpendicular position, the height of the object glass is 16 feet 4 in. (Paris measure) from the floor, 13 feet 7 in. of which belong to the telescope itself; so that the eye-glass stands 2 feet 7 in. from the floor. The diameter of the object-glass is 9 Paris inches (about 9¼ inches English.) The weight of the whole instrument is about 3000 Russian pounds. It is so constructed that it may be used as an equatorial. The upper part of the instrument consists of the tube, with its axis of motion, two graduated circles, and a variety of levers and counterpoises, producing the most perfect equilibrium in every direction, and providing against all friction. The declination circle is divided from 10' to 10', but by means

of the Vernier may be read off to $5''$. The instrument may be turned in declination with the finger, and round the polar axis with still less force.

The most perfect motion round the polar axis is produced by means of clock-work, which is the principal feature of this instrument, and the greatest triumph for the artist, the mechanism being as simple as it is ingenious. A weight, attached to a projection connected with the endless screw, overcomes the friction of the machine. The clock vibrating in a circle regulates the motion, by moving an endless screw connected with a second wheel in the above projection. The weight of the clock as well as that of the friction may be wound up without the motion being interrupted. When the telescope is thus kept in motion, the star will remain quietly in the centre, even when magnified 700 times. At the same time there is not the least shake or wavering of the tube, and it seems as if we were observing an immoveable sky.

But the artist has done still more; he has introduced a hand on a graduated dial of the clock, by which the motion of the latter can be instantly altered; so that a star may be brought to any point of the field of vision to which it may suit the observer to carry it, according as it is required to make the course of the instrument go faster or slower than the motion of the heavens; and if once placed, it may be kept in that position by returning the hand to its original position. The same mechanism is also used to make the motion of the instrument coincide with that of the sun or moon.

This instrument has four eye-glasses, the least of which magnifies 175 times, and the largest 700 times.

M. Struve has compared the power of this telescope with Shoëter's 25-feet reflector, by means of which that

astronomer saw *Orionis*, twelve or thirteen fold—whereas Struve clearly ascertained the existence of sixteen distinct stars.

This instrument is furnished with four annular micrometers of Fraunhofer's construction, and an excellent net-micrometer of the same artist. By means of these it appears that the probable error in the measurement of some minute distances of 7″ and under, did not exceed the 18th part of a second. The expense of this instrument was about £950 sterling.

There was also read a paper on "A New Zenith Micrometer," by Charles Babbage, Esq. F.R.S. &c. The object of the inventor in this instrument is to supersede the necessity of extreme accuracy in the divisions. The principle on which this instrument depends may be readily comprehended by imagining a parallelogram, admitting of free motion about its four angles, to be placed with two of its sides in a horizontal position, and the whole in a vertical plane; and a telescope to be fixed at right angles to the lower horizontal bar of this parallelogram. Here every motion of one of the perpendicular bars of the instrument round its upper joint will not change the angle which the telescope makes with the meridian; but will merely remove it into a new position, in which it will point to the same object in the heavens.—But if either of the horizontal bars of the instrument be lengthened by a very small quantity, this parallelism of the telescope will no longer be preserved, but any movement of the upright bars round their axes will not only remove the telescope from its position, but will cause it to form a very small angle with its former direction. The magnitude of that angle will depend on the alteration in the length of the arm of the parallelogram, and also on the angle which that arm makes with its first direction. The minutiæ of the construction depend upon

these considerations, but cannot be rendered intelligible without a diagram. The arc which is actually measured in the heavens by means of this instrument is determined by a formula, in which the sum of three arcs is taken from the semicircumference, one of them resulting from the actual observation; the other two from a cosine and a tangent, ascertainable by computation from the theorem itself. In an extensive use of this micrometer, tables may easily be formed to facilitate the computation.

Abstracted Report of the Select Committee of the House of Commons, on Machinery and Artizans, &c.

[*Continued from page* 219.]

Messrs. Donkin, Bramah, Taylor, Maudsley, and Hague, further examined.

Mr. Taylor being asked how long he thought it would take to produce such a number of competent workmen as would probably be required, if the laws were repealed? replied, that he considered the supply as likely to keep pace with the demand. The demand is great at present, and every engineer is bringing up workmen in anticipation of an increased demand. It would take from five to seven years to educate a good workman. The consumption of iron has increased within the last twenty years enormously, but the price of heavy machinery has considerably diminished, which has arisen partly from improvements in the process of making iron, but principally from the iron masters being able to make it for less money, and the large quantity consumed enabling them to put up with smaller profits; the same cause will probably produce a diminution in the price of machinery. All the materials of which machinery is made, are the produce of our own country—the average proportion of each it

would be difficult to determine. Copper is more extensively used in machinery than may be generally supposed. Though very great sources of consumption, such as the East India Company's contracts, have lately failed, yet copper is still in as much demand in the market as formerly.

Machinery, for which orders could not be received here, has been made in other countries. Mr. Hague refused an order for £7,000 worth, and the parties afterwards had drawings and workmen from this country, and made the machines abroad. Mr. Donkin saw a very large rolling machine making last year in Paris; manufactories have been there established, because our government prohibited the exportation. Mr. Bramah had an order for St. Petersburgh, some of which he executed; the goods, however, were seized at our custom-house, and his employer ultimately took drawings, and had the articles made in Russia, and continues to make his machinery there still. Most of the large engineer establishments on the Continent are conducted by Englishmen. Mr. Hague refused the order for an iron mill to be sent to France, and afterwards drawings and workmen went from here, and the mill was executed in France.

There is a very great demand for English machines on the Continent, if the laws remain as they are South America and other places will be supplied from France and the Netherlands—some of the largest manufactories of machinery are at Liege and its vicinity. Mr. Bramah stated that he is making some machinery for packing cotton, to be sent to Egypt; the same parties wanted carding engines, their exportation being prohibited by our laws. Mr. B. referred his customers to Mr. Cockerell, of Liege, who originally came from Manchester, has resided at Liege twenty-seven years, and acquired a handsome fortune, by making ma-

chinery for preparing cotton and wool. Mr. Maudsly also knows this large establishment; the same parties have likewise a manufactory at Sarang; about four miles off it was the Bishop of Liege's palace; the factory covers at least seven acres of ground, and they employ five or six hundred people. Mr. M. could have had orders from them, but refused. The King of the Netherlands has given Mr. Cockerel, £30,000 for the purpose of establishing an iron rolling mill, and extending his manufactory, so as to enable him to make boat engines and steam engines generally—the manufactory at Liege being principally for carding and woollen machinery. There are not now any Englishmen at the manufactory except the master; they have had a great many—it was originally established by Englishmen. These works supply every country on the Continent. Mr. M. has seen hundreds of their carding engines in different parts of France.

To be continued.

New Patents Sealed, 1824.

To David Edwards, of King-street, in the parish of St. George, Bloomsbury, in the county of Middlesex, writing-desk and dressing-case manufacturer, for his new invented ink-stand, which is so constructed that by means of pressure the ink is caused to flow to use—Sealed 26th February—two months for inrollment.

To Joseph Manton, of Hanover-square, in the parish of St. George, Hanover-square, in the county of Middlesex, gunmaker, for his invention of certain improvements in fire-arms—26th February—6 months.

To William Hopkins Hill, of Woolwich, in the county of Kent, lieutenant in our royal artillery, for his invention of certain improvements in machinery for propelling vessels —26th February—6 months.

To George Augustus Kollman, of the Friary, St. James's place, in the county of Middlesex, professor of music, for his invention of certain improvements in the mechanism and general construction of piano-fortes—26th February—2 months.

To John Heathcoat, of Tiverton, in the county of Devon, lace-manufacturer, for his invention of an improved method of producing figures or ornaments in or upon a certain description or kind of goods manufactured from silk, cotton, flax, or other yarn—25th February—2 months.

To James Bateman, of Upper-street, Islington, in the county of Middlesex, fruiterer, for his invention of a portable life-boat—26th February—2 months.

To Cornelius Whitehouse, of Wednesbury, in the county of Stafford, whitesmith, for his invention of certain improvements in manufacturing tubes for gas and other purposes—26th February—6 months.

To Thomas Atwood, of Birmingham, in the county of Warwick, manufacturer, for his invention, and having brought to perfection an improved method of making a nib or nibs, slott or slotts, in copper cylinders, or cylinders of other metal, used for printing cottons, linen, silk, stuffs, and other articles—26th February—6 months.

To David Gordon, of Basinghall-street, in the city of London, Esq. and William Bowser, of Parson's-street, Wellclose-square, in the county of Middlesex, iron manufacturer, for their invention of certain improvements in plating or coating iron with copper, or any other composition whereof copper is the principal ingredient—26th February—6 months.

To Chevalier Joseph de Mettemberg, of Foley-place, in

the parish of St. Mary-le-bone, in the county of Middlesex, physician, late surgeon-major in the French armies, for his invention of a vegetable mercurial and spirituous preparation, which he denominates quintessence antissorique, or Metsemberg's water, and also a particular method of employing the same by cutaneous absorption, as a specific and medical cosmetic—26th February—6 months.

To John Masterman, of Old Broad-street, in the city of London, gentleman, for having invented or found out an improved method of corking bottles—5th March—6 months.

To Abraham Henry Chambers, and Ennis Chambers, both of Stratford-place, in the parish of St. Mary-le-bone, and Charles Jearrard, of Adam-street, Manchester-square, in the parish of St. Mary-le-bone, in the county of Middlesex, Esquires, for their invention of a new filtering apparatus 5th March—6 months.

To William Halley, of Holland-street, Blackfriars-road, in the county of Surrey, iron-founder, and blowing-machine maker, for his invention of certain improvements in the construction of forges, and on bellows, or apparatus to be used therewith or separate—5th March—4 months.

To Robert Winch, of Steward's-buildings, Battersea Fields, in the county of Surrey, engineer, for his invention of certain improvements in, or additions to, rotatory pumps for raising and forcing water and other liquids—5th March—6 months.

To William Henry James, of Cobourg-place, Winson Green, near Birmingham, in the county of Warwick, engineer, for his invention of certain improvements on railways, and in the construction of carriages to be employed thereon—5th March—6 months.

To William Hirst and John Wood, both of Leeds, in the County of York, manufacturers, for their invention of certain improvements in cleaning, milling, or fulling cloth—5th March—6 months.

To John Linnell Bond, of Newman-street, in the parish of St. Mary-le-bone, in the County of Middlesex, architect, and James Turner, of Wells-street, Mary-le-bone aforesaid, carpenter and builder, for their invention of certain improvements in the construction of window casements, folding sashes, usually called French sashes, and doors, by means of which the same are hung and hinged in a manner adapted more effectually to exclude rain and wind, and to afford a free circulation of air—9th March—2 months.

To Thomas Hancock, of Goswell Mews, in the parish of St. Luke, Old-street, in the County of Middlesex, patent cork manufacturer, for his invention of a new or improved manufacture, which may in many instances be used as a substitute for leather and otherwise—15th March—6 months.

To Thomas Hancock, of Goswell Mews, in the parish of St. Luke, Old-street, in the County of Middlesex, patent cork manufacturer, for his invention of an improvement or improvements in the making or rendering ships' bottoms, vessels, and utensils of different descriptions and various manufactures, and porous or fibrous substances, impervious to air and water, and for coating and protecting the surfaces of different metallic and other bodies—15th March—6 months.

To Thomas Hancock, of Goswell Mews, in the parish of Saint Luke, Old-street, in the County of Middlesex, patent cork manufacturer, for his invention of an improvement or improvements in the preparation or in the process of making or manufacturing of ropes, or cordage, or other articles, from hemp, flax, and other fibrous substances—15th March—6 months.

To John Collinge, of Lambeth, in the County of Surrey, engineer, for his invention of an improvement or

improvements on springs and other apparatus used for closing doors and gates—15th March—6 months.

To Robert Bretell Bate, of the Poultry, in the City of London, optician, for his invention of an improvement on the frames of eye glasses—15th March—6 months.

To Henry Nunn and George Freeman, both of Blackfriars-road, in the County of Surrey, lace manufacturers, for their invention of certain improvements in machinery for making that sort of lace commonly known by the name of bobbin net—15th March—6 months.

To Samuel Brown, of Saville-row, Burlington-street, in the County of Middlesex, Commander in the Royal Navy, for his new invented apparatus for giving motion to vessels employed in inland navigation—15th March—4 months.

To Joseph Barlow, of the New Road, in the parish of Saint George, Middlesex, in the County of Middlesex, sugar refiner, for his new invented method or process for bleaching, and clarifying, and improving the quality and colour of sugars known by the name of bastard and piece sugars—15th March—6 months.

To William Gresenthwaite, of King's-place, Nottingham, gentleman, for his invention of an improvement in air engines—15th March—6 months.

To Richard Whitechurch and John Whitechurch, of Star-yard, Carey-street, Chancery-lane, in the County of Middlesex, for their having invented or found out an improvement upon hinges (which hinges may be made of iron, steel, brass, or other metals) for doors, cupboards, and sashes of houses, sashes of book-cases and shew-cases, and are applicable to all purposes where hinges are used, and particularly to the doors and windows of ships, vessels, steam boats, and other craft, which will enable the doors and sashes to be opened on the right and left jamb, (changing the hinges) and if required, they can be fitted either with or without a rising hinge—17th March—2 months.

To Mark Cosnahan, of the Isle of Man, Esq. for his invention of a new apparatus for ascertaining the way and leeway of ships and other vessels, which apparatus is also applicable to other useful purposes—17th March—6 months.

D.	H.	M.	S.	
1	5	0	0	☿ in conj. with ζ in Pisces.
1	19	0	0	♂ in conj. with ο in Pisces.
2	18	23	0	Ecliptic opposition or ○ full moon.
3	9	0	0	☾ in conj. with ι in Virgo.
3	11	16	59	♃'s 1st Sat. will emerge.
4	14	0	0	♀ in conj. with η in Taurus.
5	12	24	35	♃'s 2d Sat. will emerge.
5	23	0	0	☾ in conj. with δ in Scorpio.
7	9	0	0	☾ in conj. with B in Oph.
7	17	0	0	☿ in conj. with ♂ long 29° in Aries ☿ lat. 54′ N. ♂ lat. 12 S diff. lat. 1° 6′.
9	3	0	0	☾ in conj. with ο in Sag.
9	5	0	0	☾ in conj. with π in Sag.
9	17	9	0	☾ in □ last quarter.
9	18	0	0	☾ in conj. with ♅ long. 19° in Sag ☾ lat. 2° 19′ N. ♅ lat. 25′ S. diff. lat. 2° 45′
10	13	11	52	♃'s 1st Sat. will emerge.
12	7	40	37	♃'s 1st Sat. will emerge.
17	21	20	0	Ecliptic Conjunction or ● New Moon.
18	18	0	0	☿ in conj. with δ in Aries.
19	9	35	35	♃'s 1st Sat. will emerge.
19	14	0	0	☽ in conj. with δ in Aries.
19	16	0	0	☽ in conj. with ☿ long. 20° in Taurus ☽ lat. 2° 44′ N. Merc. lat. 2° 35′ N. diff. lat. 9′.
19	20	50	0	☉ enters Aries.
20	14	0	0	☽ in conj. with A in Taurus.
20	23	0	0	☽ in conj. with 2κ in Taurus.
21	21	0	0	♄ in conj with ι in Taurus.
22	23	0	0	☽ in conj. with η in Gemini.
23	2	0	0	☽ in conj. with μ in Gemini.
23	20	0	0	☽ in conj. with ζ in Gemini.
25	0	0	0	♅ Stationary.
25	12	38	0	☽ in □ first quarter.
35	22	0	0	☽ in conj. with 2α in Cancer.
26	11	30	35	♃'s 1st Sat. will emerge.
26	13	0	0	☽ in conj. with ξ in Leo.
26	17	0	0	☽ in conj. with ο in Leo.
27	0	0	0	♀ Stationary.
27	2	0	0	♃ in conj. with π in Leo.
30	9	33	35	♃'s 2d Sat. will emerge.
30	20	0	0	☽ in conj. with ι in Virgo.

The waxing moon ☽ — the waning moon ☾

Rotherhithe. J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, FEB. AND MARCH 1825.

1825.	Thermo. Higt.	Thermo. Low.	Barometer +	Barometer −	Rain in inches.	1825.	Thermo. Higt.	Thermo. Low.	Barometer +	Barometer −	Rain in inches.
Feb.											
24	42	28	30,16	30,10		Mar.	51	38	30,08	30,03	,075
25	41	29	—,28	station		12	48	36	—,04	—,00	,025
26	37	28	—,18	—,04		13	38	29	—,06	station	
27	43	33	29,77	29,50	,075	14	39	30	—,14	—,08	
28	44	28	—,59	—,50	,025	15	40	27	—,20	—,10	
Mar.						16	37	21.5	—,34	—,30	
1	46	28	—,64	—,20	,025	17	42	25	—,40	station	
2	46	28	—,18	—,12	,5	18	48	22	—,47	—,45	
3	47	30	—,36	—,32	,175	19	50	25	—,48	station	
4	45	29	—,88	—,46		20	50	26	—,48	—,39	
5	44	28	30,16	30,08		21	43	34	—,25	—,13	
6	46	30	—,08	29,87		22	48	33	—,18	—,16	
7	45	34	29,76	—,60	,25	23	52	28	—,00	29,94	
8	48	30	30,18	30,07	,05	24	49	29	29,72	station	
9	54	37	—,14	—,10	,075	25					
10	55	44	—,15	station							
11	55	45	—,09	—,00	,075						

CHARLES H. ADAMS, LOWER EDMONTON.

LITERARY NOTICES.

COLUMBUS.—The Autographical Journal of the celebrated Christopher Columbus and those of several other illustrious navigators, which have been preserved in the Escurial with the most religious care, but which no one has hitherto been allowed the perusal of, are ordered to be printed under the sanction of the King of Spain.

BRITISH MUSEUM.—It is reported with some confidence that the rare and valuable collection of antiquities made by the late Mr. Rich (whose works on Babylon display so much ability) will be secured for our National Museum. The expense is estimated at about £8000, which will be paid to the widow of this intelligent individual, and the companion of his travels and researches.

An interesting discovery has been made by Dr. Bernland, of Larris in Germany, for which he has received an Austrian patent. It consists in obtaining from certain animal substances, of which hitherto no use has been made, a product exactly resembling leather. A manufacturer has been established at Gumbold near Vienna, where this new species of industry is practised with the greatest activity. This discovery is the more important as the composition is said to be capable, when in a fluid state, of forming boots and shoes.

The Rev. Dr. Nares is preparing for publication, in two quarto volumes, the Memoirs of the Life and Administration of the Right Hon. William Cecil, Lord Burleigh, Lord High Treasurer of England in the Reign of Queen Elizabeth, with extracts from his private and official correspondence and other papers; the work is to be embellished with portraits.

An inedited MS. of the celebrated author of Telemachus, has been lately found buried among the archives of the establishment of St. Anne, in the town of Cambray. We owe the discovery of this MS. to the enlightened researches of Doctor Le Gray, Perpetual Secretary of the Society of Emulation in the city of Cambray. It was composed by Fenelon in the year 1702, and is intituled, *Reponse de l'Archevêque de Cambrai au Memoire qui lui a été envoyé sur le droit avenement.*

A physician of the name of Buller, resident at Hamburgh, is said to have recently invented an instrument for the purpose of amputation, by means of which he can take off a leg in one second, and which has the effect of benumbing the pain of the patient by a simultaneous pressure which attends the operation.

Mr. Charles F. Partington will have ready in a short time the Century of Inventions of the Marquis of Worcester, from the original MSS. with Historical and Explanatory Notes, and a Biographical Memoir. The Work will contain twenty-four illustrative engravings.

Mr. John Nicholson has a work nearly ready, in one closely printed 8vo. volume, entitled the Operative Mechanic and British Machinist, which will exhibit the actual construction and practical uses of all Machinery and Implements at present used in the Manufactories of Great Britain; it will be illustrated by engravings of several hundred subjects.

Announced for the next month, a Complete Treatise on Rail Roads, &c. by Nicholas Wood, Esq. of Killingsworth Colliery, Newcastle-on-Tyne.

Mr. Lewis is engaged in engraving a Portrait of Lord John Russell, from a drawing by Mr. Slater, which is to be circulated among subscribers only, and the personal friends of this nobleman.

Among forthcoming novelties will be found a work on *Pompeii*, by Sir W. Gell and J. P. Gandy, which will contain above an hundred engravings.

There has recently been discovered in an Abbey of Benedictine Friars in Italy, several musical instruments, which are supposed to belong to a very early age. Among them is a *cithara*, constructed of ivory, with strings of gold wire, mounted with clusters of diamonds in the form of a rose; there is also an antique tabour pipe, to which several rare and valuable medals are suspended.

LONDON:
SHACKELL AND ARROWSMITH, JOHNSON'S-COURT, FLEET-STREET.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. LIII.

Recent Patents.

To Lemuel Wellman Wright, *late of Wellclose-square, in the county of Middlesex, but now of Lambeth, in the county of Surry, Engineer, for his Invention of Certain Combinations of, and Improvements in, Machinery for Making Pins.*

[Sealed 15th May 1824.]

The truly ingenious machine which forms the subject of this patent, comprehends a diversity of mechanical movements and contrivances, by which a coil of wire is rapidly converted into pins, without the instrumentality of manual assistance, or any extraneous aid whatever. The wire being placed on a reel, and the machine set in operation by steam, or other motive power, the main shaft, upon which the several cams are fixed, begins to revolve, and the various mechanical apparatus thus put in motion, simultaneously draws the wire, straightens it,

cuts it of the required length, points it, forms the head, and drops the pin thus perfected into a receptacle prepared for it. A piece of mechanism embracing so many movements, and performing such a variety of functions essentially differing from each other, may be considered so complicated, as to prove very troublesome while in action, and become easily disarranged; but this machine, which is comparatively simple in its construction, performs its various motions with little noise, and less apparent effort, and cannot readily be put out of order. Its susceptibility of adjustment, too, greatly recommends it, as the pins may be made of different lengths, the heads of various forms, and the points lengthened or shortened at pleasure, without arresting the progress of any of the movements. The wire for four pins, is operated upon at the same time, and the machine completes with facility forty perfect pins per minute, of a quality superior in every respect to the best of those in ordinary use.

Plate XII. fig. 1, is a geometrical representation of the machine, taken on the side; fig. 2, is a similar view, exhibiting the end; and fig. 3, is the plan or horizontal appearance of the top: similar letters refer to the same parts in each of these three figures. A coil of brass wire of the size suited to the intended pin is placed upon the reel, *a*, which turns loosely upon its vertical axle at the side of the machine. The end of the wire is brought forward and passed between the pins of the plate, *b*, (fig. 3,) called a straightening plate, which is intended to guide the wire in a direct line as it advances; it is thence passed between the chaps of the pincers, *c*, where it is held fast and conducted into the cutting dies, *d*.

Having thus disposed the wire, the machinery is o be put in motion, either by turning a winch or by gear connected to the shaft, *e*. At one end of this shaft a fly

wheel is attached, in order to regulate the motion, and at the reverse a beveled tooth wheel, which takes into another beveled toothed-wheel on the end of the main shaft, *f*, *f*, *f*. Upon this main shaft a series of cams are fixed, which, as the shaft revolves, respectively press against certain bars and levers, and thereby give motion to all the operative parts of the engine.

The movements of the machine first bring forward the end of the wire, which is held between the pincers; this is done by the cam 1, as the shaft revolves, working against the friction roller at the end of the slider *g*, by which that slider is pushed forward. The effect of projecting the slider, will be, in the first place to move the small cross lever, *h*, when a tappet under that lever will press against an inclined plane on one of the legs of the pincers, which thereby closes the chaps, and cause the wire to be held securely; the further progress of the slider brings the projecting piece 2 against the end of a screw on the side of the pincers'-carriage, by which means the pincers holding the end of the wire are advanced a certain distance. This distance is regulated by the adjustment of the screws, and by that means the machine is enabled to make the pins longer or shorter, as may be required.

A length of wire sufficient for one pin having been thus brought forward, on the retiring of the cam 1, a worm spring carries the slider back to its former position; and in doing this the small lever *h*, by quitting the inclined plane, enables the chaps of the pincers to open, and then the projecting piece 2, striking against the other screw, forces the pincers'-carriage back with it, the wire being at that time held fast by the pins on the straightening plate, and thereby prevented from returning. Thus so much of the wire as will be required to form one pin is made to advance at every revolution of the cam 1.

Supposing a sufficient length of wire for making one pin to have been passed through the die, *d*, it is now to be cut off. The manner of doing this will be best seen by reference to the detached figure 4, which is a section of the die upon an enlarged scale; 3, is a roller at the end of the arm, *i*, seen affixed to the slider, *g*, in fig. 3. When the slider, *g*, returns, after driving the wire forward, the roller 3 presses against the inclined plane on the under side of the lever 4, and by raising it depresses the reverse end of the lever, and thereby presses down the cutter 5, which has a sharp edge at the apex of its conical recess, and thereby cuts off the length of wire for one pin. The advance of the slider, *g*, at a second operation, sends forward the roller 3, and the lever 4 descends, by which the pin is released, and is taken thence by the carrier about to be described.

These carriers are seen at *k*, *k*, *k*, *k*, in fig. 2 and 3, affixed to the bar *l*, *l*, by sockets and screws, which bar slides laterally to and fro with the carriers for the purpose of taking the pins from one operation to the next. The construction of the carriers will be best understood by reference to the detached fig. 5, which exhibits a side and end view, upon an enlarged scale: its holding part is a pair of pincers, the upper chap being a firm piece of metal fixed to its stem, the lower chap attached by a spring, which presses them together. The opening of the chaps is exactly in the line of the die, *d*, so that when the carrier by the sliding of the bar *l*, is brought opposite to the die, the pin slips sideways in between the chaps, and is there held by the spring in a small groove: the lever of the cutting die rising at the same time, as before explained, releases it.

The lateral movement of the bar, *l*, by which the pin is carried from the cutting die to be pointed, is effected by

the rotation of the excentric cam 6, upon the main shaft *f*, which cam as it revolves, occasionally presses down the lever *m*, and by means of a cord attached to the end of this lever, and passed over a pulley 7, to the shackle at the end of the bar, *l*, that bar with the carriers is drawn forward.

The pin has now been brought by the carrier *k*, to the first pointing wheel, *n*, and is there received by the first holder, *o*. This piece of mechanism, called the holder, is shewn detached at fig. 6. It is of a cylindrical form, with a mouth and moving, chap 9. The end of the pin is brought by the carrier into the mouth of the holder, and is there held until the chaps close and confine it, which is done by the following contrivance. As the main shaft, *f*, revolves, the cam 10 recedes from the friction wheel at the end of the sliding bar, *p*, and enables a powerful spring beneath to draw backward the bar, *p*, which carries with it the yoke, *q*, and the collars, *r*, that are embraced by the yoke; which collars slide upon the cylindrical holders, *o*, as seen in fig. 6. At the hinder part of the lever which moves the chap 9, (see fig. 6.) there is an inclined plane, which is raised by a notch in the collar, *r*, as it recedes, and by that means the chap is closed and the pin held fast, the part intended for the point standing over the pointing wheel, *n*. The lever, *m*, now rising, the bar with the carriers will be drawn back into their former situation by the force of the spring 8, and remain there ready to take hold of and carry forward succeeding pieces of wire.

The pointing of the wire is effected by the rapid revolution of the bevel wheel, *n*, which is cut on its edge like a file. This bevel wheel is actuated by a band, extending from a series of multiplying wheels in connection with the revolution of the fly-wheel on the axle of the shaft,

e. From this fly-wheel a band is conducted down to the rigger, *r*, as seen in fig. 1 and 2; upon the shaft of which rigger there is a large wheel, *s*, from whence a band passes to the rigger, *t*, and upon the shaft of this rigger, *t*, there are the large wheels, *u*, *u*, from whence bands pass upwards to the pointing wheels, *n*. Thus as the shaft *e*, turns the pointing wheels, *n*, revolve with a multiplied velocity, equal to about four thousand times that of the fly-wheel.

In order to bring the end of the pin down upon the pointing wheel, *n*, the holder, *o*, must be tilted; this is provided for by mounting the holder-carriage upon axles, which allow it to vibrate, the tilting being effected by the cam 12, on the shaft, *f*. As this shaft revolves the periphery of the cam 12 runs against the upper side of the lever 13, the end of which is attached to the holder-carriage (see fig. 3 and 6) and keeps the holder in a level position during one half of the revolution; but when the cam releases it, which is the case at the time the pointing is about to commence, a spring draws up the lever 13, and the carriage is so far tilted as to allow the pin to come in contact with the periphery of the pointing wheel. It is also necessary to hold the pin steadily upon the wheel while the pointing is performed, this is done by the lever 14, (see fig. 6) which moves upon pivots. As the cam 15, on the shaft, *f*, fig. 3, revolves, it pushes the sliding bar 16, which has at its end a small inclined plane 17, (see fig. 6) that lifts the back end of the lever, and consequently depressing the front part where the finger 18 is attached; by these means the finger is made to bear upon the pin, and hold it down in contact with the rapidly revolving pointing wheel, *n*, before described.

It is necessary to turn the pin round while it is in contact with the pointing wheel, and for this purpose the pin-

holder is made to revolve by the following means. On the shaft, *f*, fig. 3, there is a cam which acts against the under side of the weighted lever *v*, *v*, at the end of which lever there is a vertical rack, 19, taken into the toothed pinion at the hinder part of the holder, *o*; this pinion is seen at 20, in fig. 6, and by the rising and falling of this lever and rack, the pin-holder is made to turn with considerable speed; at the same time the pointing-wheel, revolving with great velocity, as above said, cuts or files away the end of the pin in a bevel direction, and effects the pointing.

As the pointing is considered not to be complete from the operation of the first pointing-wheel, a second pointing-wheel is introduced, which has a finer cut file upon its edge. The pin, after having undergone the first process of pointing, is carried from the first holder, *o*, to the second, *o*, by the second carrier, *k*, exactly in the same manner as before described; the second holder now clasps the pin between its chaps, by similar means to those already explained, and the holder and pointing-wheel both revolve, to complete the point of the pin by the agency of wheels and bands, actuated as above said, by the rotation of the shaft, *e*, and its fly wheel.

The third carrier, *k*, now takes the pin from the second pointing-holder, *o*, and conducts it to the first heading die, *w*, which is seen detached, upon a larger scale, and in section, at fig. 7. This die is set in its frame as at *w*, in figs. 1, 2, and 3; the lower half being fixed to the frame, the upper half to the lever above, which rises by the action of a flat spring, and opens the mouth or chaps of the die. The pin being in this situation between the chaps, the cam 21 upon the shaft, *f*, as it revolves, acts against the friction roller 22, at the top of the upright lever 23, and drives the connecting rod 24 forward, by which means the upper

chap of the heading die is brought down, and the pin held fast. When the pin is thus secured between the chaps of the die, the cam 25 projects forward the heading bar, *x*, *x*, *x*, which, by striking against the end of the cylinder 26, fig. 7, drives the steel punch 27, at the extremity of the cylinder, against the end of the pin about to be headed, and forces a portion of the wire into a circular recess in the die, so as to produce by its pressure a solid head to the pin.

The fourth carrier, *k*, now takes hold of the pin, and the parts of the die opening as the cams 21 and 25 revolve, the pin is conducted by the carrier to the second heading apparatus to be completed, a section of which is shewn at fig. 8. The pin is now held by the carrier opposite to the opening of the second heading-die, *y*, when the advance of the heading-bar, *x*, as before described, causes the punch 28 to be driven forward, and the point of the pin to be pushed into the recess of the die, where the partially formed head, stopping the progress of the pin, the punch presses it with very great force, and completes the formation of the solid head.

The pin being now completed, it only remains to withdraw it from the die, *y*, which is done by the following contrivance:—Behind the die a piece of bone or wood is placed in a sliding-rod, 29, for the point of the pin to enter: this rod has a helical spring coiled round it, which keeps it up against the back of the die, and when the pin is forced into the piece of bone by the advance of the punch, the rod 29 recedes, but as soon as the punch is withdrawn the spring forces the rod back again, and the pin with it, by which the head of the pin is made to stand out of the die. A small forked-lever, *z*, attached to the heading-bar *x*, now drops on to the end of the pin, and as the heading-bar, with the forked-lever retires, the

pin is drawn out of the die and let fall into a box or other receptacle below.

The several parts and different operations of this highly ingenious piece of machinery having been particularly explained, it may be desirable to recapitulate in a general way the several movements, by which, from plain wire the pins are formed and perfected in their progress through the machine, four pins being under operation at the same time.

The rotation of the shaft, *f*, causes the several cams thereon to move the sliders, levers, and wheels that work the different parts of the machine. The slider, *g*, pushes the pincers, *c*, forward, which draws the wire from the reel, *a*, and at every rotation of the shaft, advances such a length of wire as will produce one pin. The die, *d*, cuts off the length of wire by the descent of its upper chap, which piece is shewn (full size) at A. fig. 10; and when the chap opens the first carrier, *k*, takes the pin from thence to the pointing apparatus. Here the pin is received by the holder, which turns round while the bevel-edged file wheel rapidly revolving reduces the end of the wire to a point, as seen at B. fig. 10. The pin is thence conducted by the second carrier to the finer file wheel, where the point is completed by a similar operation, as seen at C. fig. 10. The third carrier now takes the pin to the first heading-die, where the advance of a steel punch forces the end of the pin wire into a recess, and partly forms the head, as D. fig. 10. The fourth carrier takes the pin from thence and brings it to the second heading-die, where the head is perfected, as at E. fig. 10; and the retiring of the heading-bar, causes a forked lever to draw the finished pin from the die, and drop it into a receptacle below.

Inconsiderable as the article produced by this scientific piece of mechanism may appear, to the superficial ob-

server, we are nevertheless enabled to state, from incontrovertible sources of information, that more than *fifteen millions* of pins are *daily* manufactured in this country, to meet the demand for home consumption and the foreign markets. We have little doubt that the superior quality of these pins, and the facility and perfection with which they are produced by this invention, will in a little time supersede every other mode of manufacturing them. We understand that ninety of the machines are nearly completed, and will soon be in constant operation, at the Factory, near the Obelisk, in St. George's Fields.

[*Inrolled, November,* 1824.]

To William Davis, *of Bourne, in the County of Gloucester, and of Leeds, in the County of York, Engineer, for certain Improvements in Machinery, for Shearing and Dressing Woollen, and other Cloths requiring such Process.*

[Sealed 24th July, 1823.]

These improvements apply to apparatus employed in two distinct operations connected with the finishing of woollen and other fabrics, viz. the shearing or cropping, and the brushing or dressing of the cloths. The improved shearing machine is so constructed that it can be made to crop the face of the cloth either lengthways or crossways; and one machine is capable of operating upon cloths of any width. The improved dressing or brushing machine is a variation from the ordinary gig-mill, for the purpose of raising the pile of the cloth before shearing, and for polishing it after shearing; it consists of a series of revolving card cylinders, or indented surfaces, which are made

to pass rapidly against the face of the cloth, in order to lay the nap and polish its surface.

Plate XIV. fig. 1, is an end view of the machine employed for raising the pile of cloths previously to shearing. The improvements consist in substituting for the fixed teashes of the ordinary gig barrel a series of revolving card cylinders: *a*, is the main shaft of the machine, actuated by a steam-engine or other first mover: near the ends of this main shaft two circular plates, *b*, are attached, which carry the axles of the series of cylinders, *c*, *c*, *c*, covered with cards: at the ends of these cylinders toothed wheels are affixed, which take into the teeth set round the inner circumference of the ring, *d*; and as the main shaft revolves with the end plates, the cylinders, *c*, are carried round, and by the toothed-ring, *d*, being stationary, the cylinders, *c*, are made to turn upon their axles:—*e*, and *f*, are two retarding rollers set in a frame, between which the cloth is passed; these retarding rollers may have their positions altered by means of the pinion, *g*, and rack to which their frame is attached.

From these retarding rollers the cloth proceeds downwards under the gig-barrel, where its face is acted upon by the card cylinders: thence upwards to the roller, *h*, under which it passes, and is pressed thereon by two smaller rollers, *i*, *i*; over these the cloth is conducted, and thence let fall at the back of the machine to the floor, or coiled upon a receiving roller.

On the main shaft there is a drum wheel, from whence a band extends over the wheel, *k*, which, by means of the pinion upon its axle, turns the toothed-wheel, *l*, fixed to the axle of the cylinder, *h*. The cloth passed over this cylinder is kept tight upon its periphery by the pressing rollers, *i*, *i*, and is drawn forward slowly by the revolu-

tion of the cylinder, while the gig turning causes the card cylinders to revolve rapidly in a contrary direction, raising the pile of the cloth as it advances.

The rotation of the card cylinders may be effected by means of friction instead of pinions taking into the toothed ring; and in order to remove flock and other matters from the cards, a brushing cylinder is placed at *m*, which may be actuated by a band from the drum-wheel on the main axle. Smoothing or polishing cylinders, or surfaces, may be applied to act alternately with the card cylinders, or the cloth may be polished by a separate machine, after raising, or by the above described machine driven in the reverse direction.

The cylinders, *c*, have been described as covered with cards; it is, however, in the contemplation of the patentee to make them of circular plates of metal, formed into ratchet teeth on their outer edges. These plates are to have each a hole through the middle to receive a bar with collars, projecting rings, or nuts at each end, to confine the pointed plates and keep them close together. In raising the pile of the cloth they are to turn so that the points of the teeth may penetrate the cloth; but in polishing, smoothing, and laying the pile they are to turn the reverse way, and much more rapidly. The diameter of these cylinders must be small, or they will not act with sufficient effect.

It is considered desirable that a reciprocating motion should be given to the gig-barrel in a lateral direction, the design of which is to distribute the action of the points more equally over the surface of the cloth when dressing than has been heretofore effected in machines of the gig kind employed for raising or dressing cloth. To accomplish this object inclined planes or snail formed cams

are placed on the axles of the gig-barrel near the ends, which, as the barrel revolves, causes it to traverse to and fro in a lateral direction.

Fig. 2, is an end view of the improved shearing frame; *a*, is the bed or bar, over which the cloth is drawn to be shorn: *b*, is the revolving cylinder, round which the helical cutters are twisted: *c*, is the ledger blade or back for the edges of the helical cutters to run against, acting together as shears. The revolving cutters, and also the ledger blade, are mounted in a frame, which turns upon hinges or an axle, for the purpose of allowing the cloth to be introduced between the cutters and the bed.

This machinery is put in motion by means of a band, extending from the rotatory part of a steam-engine, or any other rotatory first mover. This band is passed over the rigger, *d*, fixed at the end of the main-shaft, *e*, and at the reverse end of this shaft a larger rigger, *f*, is attached, from whence a band passes to the cutting cylinder, *b*, and by that means it is made to revolve rapidly. In the front of the machine there is a hollow tube, *g*, into which steam or a heater is to be introduced, for the purpose of heating the cloth as it passes over: *h*, is a cylinder covered with cards, by the rotation of which, the cloth is drawn forward over the bed or bar; this card cylinder is driven by a band from a pulley on the main axle. At *k*, a bar is placed, which extends along the front of the machine, pressing against the cloth for the purpose of keeping the cloth tightly distended over the bed; *l*, is a roller under the card cylinder, for guiding the cloth downwards, and preventing it from coiling round the card cylinder; *m*, is a rotatory brush, employed in raising the pile when the cloth is under the operation of shearing in the direction of its length.

The several parts of the machine, as the cutters, the ledger blade, and the bed, are all adjustable by screws, and there are arrangements for adapting the machine to the cropping or shearing of different kinds and qualities of cloths.

In this machine the cloth to be shorn may either pass under the cutters lengthwise, the shearing being continued from end to end by an uninterrupted rotatory motion, or the shearing may be performed crossways of the cloth, that is from list to list, it being shifted on its bed from time to time, so as to bring the different portions of the piece of cloth in succession under the operation of the cutters, by which means the broadest cloth that is made can be drawn over in the direction of the breadth, and shorn, without requiring more room than narrow cloth.

The improvements in the shearing machine further extend to the construction of the cutters, and also to the bed or bar over which the cloth is distended. As respects the first of these, the patentee states in his specification, that he takes "sheet or thin steel, or steel and iron welded, a little broader and longer than the intended cutter, and forms it into a circle, by hammering, or rolling to a diameter, that will cause an imaginary line passing through the centre across from one edge of the cutter to the other nearly to coincide with radial lines of the cylinder at any part of the whole length of the cutters when the cutter is extended to the required cutting edge." He then proceeds to say—"I next insert these cutters into grooves, cut in a cylindrical bar, or tube of metal, or else formed by bars or ribs, put on a cylindrical bar, or tube, at the required cutting angle; then heat and immerse the bar, or tube and cutters, into hardening fluid."

The improvements are said further to consist—"in grooving cylinders with rotative cutters, to receive helical

cutters, and in fixing helical cutters with wire, or small slips of metal driven into grooves with the cutters, which enables me to fix helical cutters in grooves, the depth of which exceed the breadth, hence an expeditious and permanent fastening is obtained, also more strength in the cylinder."

The improved construction of the bed applies particularly to the diagonal shearing machine, for which the same inventor obtained a patent in 1821, under the title, "*certain improvements in machinery for shearing or cropping woollen, and other cloths requiring such process.*" (See Davis's Patent, Vol. II. page 88, of this Journal.) The object of this, is to prevent the headings and lists from being cut as the cloth passes over the bed. Fig. 3, represents the internal appearance of the improved bed; the novel parts designed to protect the list, are the slide, *a*, worked by the screw, *b*; a series of pieces of metal, *c*, *c*, which individually sink by their own gravity, as the wedge part of the slide recedes. Fig. 4, is an enlarged representation of the end of a bed different to the above, which is considered to be preferable, but is more expensive. "1, is the casing, 2, a projecting rib, fixed to the casing; 3, a roller; 4, a spring; 5, a piece of metal, of which there are two series moveable on pins; the projecting part of 5, acts as a stop in one direction, but will give way in the opposite direction; 6, springs; 7, wipers or lifters; 8, a bar; 9, a bolt, over the end of which the cloth passes to be shorn. The length of bed required is filled with bolts, 9, allowing a thin piece of metal between each as a partition, inserted partly into saw cuts in the casing. The number of lifters are equal to the number of bolts. That part of the lifter surrounding the bar 8, has a projection or lock-piece, on one side, and a recipient on the other, to receive the projection of the next in succession; the space in one

is not filled with the projection of the other, the difference is about one-fourth of the circle, one of the end lifters is made fast to the bar, but the bar is allowed to move freely in all the others; thus it is clear if the bar be turned on bearings in one direction, the bolts will be driven in succession one way, and by turning the bar the reverse, the bolts will reverse in succession; or one lifter only performs, by being allowed to move on the bar, in the direction of the length, but not round. The end of the lifter, after moving a bolt, passes through a space in the concave plate, which directs the lifter to the next bolt in succession. The bar 8, is driven by one of the moving parts of the machine when the heading is passing. Two bars and lifters are sometimes applied to move the bolts in reverse directions."

The improvements in shearing machines further consist in certain variations and alterations of an apparatus invented by Stephen Price, of Stroudwater, and for which he obtained a patent, that has subsequently become the property of the present patentee. Fig. 5. is a cross section of this machine, and as the improvements are not particularly pointed out, we give the words of the specification—" *a*, is the frame; *b*, a sliding frame, supporting the bed, *k*; *c*, the lifter; *d*, a screw, to raise or lower the bed; *e*, a lever fixed to the lifter axis; *f*, a strap wheel; *g*, a strap wheel, fixed on the axis of one of the brushes, *h*; *i*, the delivering roller; *j*, drawing roller; *l*, back, to which the flat bed is fixed; *m*, the bearing of rotative cutter; *n*, a wood rail, over which the cloth is drawn; *o*, a bar or rail, under which the cloth is drawn; *p*, bolt holes, for fixing the two end frames with collar bolts."

[*Inrolled, January,* 1824.]

To James Cook, *of Birmingham, in the County of Warwick, Gun Maker, for his Invention of certain Improvements in the method of Making and Constructing Locks for Guns, Pistols, and other Fire-arms.*

[Sealed 20th May, 1824.]

The object of this invention is the construction of gun and pistol locks upon a more simple principle than those heretofore made; instead of the usual main-spring formed as a lever, the patentee proposes that the hammer shall be projected forward in a right line, by means of a helical or worm spring, by which contrivance, all the operative parts of the gun lock are contained in a cylinder within the head of a walking stick. The invention appears to be particularly suited to such guns and pistols as are to be discharged upon the percussion principle; but the helical spring may be adapted to a flint lock.

Plate XIV. fig. 6, is a section of the improved gun lock, inserted in a walking stick; *a*, is the barrel of the gun, at the end of which is the breach, *b*, formed upon what is called the patent breach principle; *c*, is the nipple or touch-hole, to receive the copper cap or other detonating contrivance; *d*, is the end of the plunger or hammer, projected forward by the discharge of the helical spring, *e*, coiled round the rod of the plunger. This rod slides through a square aperture in the cylindrical piece, *f*, and at the end of the rod is the bridle, *g*, with a cross or button at its extremity. The button is passed into a transverse slot or hole, in the plate of the buck horn handle, *h*, which handle rises up on the hinge joint, *i*.

The gun is to be loaded in the usual way, but instead of a ramrod, a brass plug, carried in the pocket of the sportsman, is to be made use of, for the purpose of forcing the paper or wadding upon the charge. For priming the gun, the stick unscrews at the joint, *b*, when the copper cap or other detonating contrivance is put upon the nipple or touch-hole, and the parts screwed together again. In cocking, the end of the hooked handle is to be raised upon its joint, which by means of the button passed through the slot, draws the sliding plunger and spring back, and they are held in that position by the sear *k*, which falls into a notch in the plunger rod. When the gun has been thus cocked, the handle is pressed down again to its former position, and it may be carried as an ordinary walking stick. To discharge the gun, it is to be brought up to the shoulder as usual, and aim taken along the side of the barrel, the trigger being then pulled by the finger, the sear liberates the sliding rod, and the helical spring carries it forward with great force, causing the plunger or hammer to strike against the end of the touch-hole or nipple, and by the blow to explode the detonating composition, which sets fire to the gunpowder within.

The lock, with all the mechanism for discharging the gun, being placed within the diameter of the barrel, its appearance is simply that of an ordinary cane, with a buck horn head, and a plug ferrule in the bottom or muzzle. In the heaviest rain no water can insinuate itself to the priming, and the copper cap or other detonating contrivance being unclosed, its particles cannot fly about when discharged; and the simplicity of the contrivance renders it extremely improbable that the lock should at any time get out of order while using.

To accommodate those sportsmen, who are attached to the old mode of pressing the butt of the piece against the shoulder, the inventor has contrived that the head may be detached from the barrel, and a butt carried in the pocket of the sportsman, screwed on when required. The patentee states, that the barrels of these guns are made of the best *twisted stub iron*, are equal in quality to those commonly charged twenty guineas, and will kill as far off as any guns that are made; they are safer to shoot with than any other description of guns, as only one-half the powder is required to charge with, from the circumstance that ignition takes place in the centre of the patent breach, and all the powder is discharged at once. Beside these advantages, it possesses one which may be thought of some importance, viz: gentlemen and farmers in walking over their grounds, need only take in their hand what may appear to be a walking stick, and still be prepared for any game that may cross their way, without the formidable appearance of carrying a gun.

[*Inrolled, November*, 1824.]

To JOHN SHAW, *of Milltown, in the Parish of Glossop, in the County of Derby, Farmer, for his Invention of Transverse Spring Slides, for Trumpets, Trombones, French Horns, Bugles, and every other musical Instrument of the like nature.*

[Sealed 7th October, 1824.]

The intention of these transverse spring slides, is to enable the performer upon the trumpet and other similar

wind instruments, to produce a greater variety of notes and half notes, than have heretofore been produced upon those instruments. These transverse spring slides, are attached to the trumpet, so as to intercept the holes, and as the instrument is blown, the different notes and half notes are produced, by pressing with the finger upon keys, which cause the slider to descend and close the apertures.

Plate XIV. fig. 7, is a trumpet with four of these improved transverse spring slides adapted to it; fig. 8, is one of the spring slides detached. The contrivance consists of sliding hollow tubes fitting into each other, which are kept extended by the helical spring. The tube, *a*, is attached to the pipe of the trumpet, as at A, fig. 7, the the lower hole being in the line of the pipe. When the trumpet is blown, the wind passes upwards from the long pipe through a hole into the tube, *a*, and escapes through the hole above it, by which means a certain tone is produced. When it is necessary to make the tone emitted from this hole half a note lower, the finger of the performer presses the top of the tube, by means of a projecting piece or lever, and by sliding the tube down, closes the upper hole, and causes the wind to traverse round the tube, and to discharge itself at the opposite hole in the tube, *b*; the note emitted, will now be half a note lower than the natural note produced when the sliding tube was extended. To effect a further depression of the tone, the transverse spring slider, B, is to be acted upon in the same way, the depression of A and B, lowering the tone emitted a whole note. The third transverse spring slider being also depressed by the finger of the performer, will cause the tone to be further lowered half a note, making by the depression of the three transverse sliding tubes, A, B, and C, a tone of one note and a half below the natural note.

When it is required to raise the natural tone half a note, the fourth transverse spring slider, D, is to be acted upon; this is constructed like the former, but reversed in its position, and by pressing upon the key or lever, connected to this slider D, a hole is opened through which the wind passes, and the tone given will be half a note higher than the natural note. It is scarcely necessary to say, that when the finger of the performer is removed from the key, that the slider is by the helical spring forced back into its former position.

The invention is the transverse spring sliding tube, to be adapted to trumpets, trombones, French horns, bugles, and such other musical wind instruments as it may be applicable to; these, however, varying in their construction, renders it necessary, in adapting the invention, to modify the spring slider and its keys in different ways to the several instruments; this is in the contemplation of the patentee, but he has not thought it necessary to exhibit all the modes by which such adaptations may be carried into effect.

(*Inrolled, November,* 1824.)

To ALEXANDER DALLAS, *of Northumberland Court, Southampton Buildings, in the Parish of St. Andrew, Holborn, in the County of Middlesex, Engineer, for his Invention of a Machine to Peck and Dress Stones of various descriptions, particularly granite stone.*

[Sealed, 27th April 1824.]

The patentee proposes, instead of dressing stones by manual labour, by the chisel and mallet, as usual, to em-

ploy a falling lever, which has peckers or chisels fixed at its extremity, for the purpose of pecking the surface of the stone as the lever falls upon it. This lever is to be actuated by a break wheel, which as it revolves, depresses the shorter arm of the lever, and consequently raises the longer arm, with the peckers. When the end of the lever escapes from under the break or tooth of the wheel, the raised end with the peckers falls heavily upon the stone placed under it, and pecks or chips its surface.

Plate XV. fig. 1, is a side view of the apparatus; *a*, is the break wheel revolving upon an axle, which has its bearings in standards, and may be actuated either by the hand winch, or by attaching a rigger to its axle, and carrying a band from a steam engine or water wheel round the rigger; *b*, is the lever vibrating upon pivots as its fulcrum in the standard, *c*; near the end of the longer arm of the lever, the peckers or chisels are fixed, and as the wheel revolves, the teeth or breakers coming against the end of the shorter arm of the lever, raises it into the position shewn by dots; *d*, is the stone about to be operated upon, which is placed in a truck, *e*, and is brought under the falling lever. When the shorter arm of the lever has escaped from the tooth of the wheel, the peckers fall with considerable force upon the stone, and repeat the blows as often as one of the teeth acts against the end of the lever.

The action of the pecker being limited, it is necessary frequently to shift the situation of the stone under it; this is done by moving the truck backwards and forwards, and also by turning the stone round in a horizontal direction upon a centre pin in the middle of the truck, which movement is effected by the labourer who guides the handle of the truck during the operation.

By shifting the peckers or chisels, and fixing others in their place as circumstances may require, different parts of the work may be done, and different kinds of stone may be operated upon; if a chisel is placed in the lever, and the truck drawn backwards and forwards in a straight line, the stone may be cut asunder, or by moving the truck in a suitable way, any portion of the stone may be chiseled or pecked off.

[*Inrolled, October,* 1824.]

To DANIEL TONGE, *of Liverpool, in the County Palatine of Lancaster, Ship Owner, for his new Invented Apparatus, by means of which, an Improved Method of Reefing Sails is effected.*

[Sealed 15th April, 1824.]

In describing this invention, the patentee has exhibited the main top-sail of a brig, or other square rigged vessel, which sail is divided into two parts, across the middle horizontally. Plate XV. fig. 2. shows the invention; *a*, is the upper portion of the sail, called the *top-sail head*: *b*, is the lower portion or *top sail-foot*, and between these is the yard arm, *c*, of the second sail; *d d*, are the reef pendants leading through blocks down to the deck; *e, e*, additional bolt ropes, from which the reef points depend. By means of these ropes, the upper sail or top-sail head may be hauled down and becalmed, when it would hang bellying, as shewn by dots. The top-sail head being fastened to the middle yard arm, *c*, when it is found requisite to close reef the top-sail, the upper yard is

lowered to the middle, which by this contrivance may be effected without sending men aloft. The usual method of rigging top-sail yards, with the ordinary appendages is adopted, and the lower or top-sail foot is secured to the yard below.

[*Inrolled, October,* 1825.]

To Thomas Leach, *of Friday-street, in the City of London, Merchant, but now residing at Litchfield, in the County of Stafford, for his invention of Improvements in certain parts of the Machinery for Roving, Spinning and Doubling Wool, Cotton, Silk, Flax, and all other Fibrous Substances.*

[Sealed 18th August, 1823.]

These improvements apply to the retention of the bobbins of a spinning or roving machine, by the friction of a small cord passed round a pulley upon the bobbin, in order to enable the bobbins to take up the spun thread from the ends of the flyers. To this cord a weight is suspended, or a lever attached for the purpose of pressing the cord against the pulley, and thereby retarding the revolution of the bobbin. The improvements are shown in the specification in detached pieces, presuming that the general construction of a roving or spinning machine is well understood.

Plate XV. fig. 3. shews one of the bobbins and flyers of a spinning machine, placed in a horizontal position; *a a*, are the two rails that support the spindle; *b*, is the pulley over which a cord is passed, leading from the revolving drum as usual, and by means of this drum, cord,

and pulley, the spindle with the flyers, *c c*, and also the bobbin, *d*, are made to spin round with great rapidity. The thread or filaments of cotton or other material about to be spun, are brought along the hollow spindle and through the eye at *e*, whence they pass down the arms of the flyers, *c e*, and deliver the thread round the periphery of the bobbin, *d*. It is however obvious, that if the bobbin spun round with the same velocity as the spindle and flyers, that the threads could not be wound upon its periphery. In order therefore to wind, or cop, as it is termed, the threads upon the bobbin, it is necessary to partially retard the revolution of the bobbin, and this is to be done in such proportion to the rotation of the spindle, as will afford time for the spinning to perfect the thread; and upon the accuracy of adjusting this part of the process, will depend the quality of the thread produced. Beside this, it is necessary to slide the bobbin backward and forward upon the spindle, in order that the flyers may lay the threads in regular succession one beside the other from end to end. This is done by what is called the copping rail, shewn in action at *f*; this rail by means of machinery not shown, (but which is well understood) is made to traverse to and fro, carrying with it the standard, *g*. An end view of the bobbin, the copping rail, and the standard, is shewn in fig. 4. From the top of the standard *g*, a string or small catgut is passed over the pulley of the bobbin, and a small weight attached to its extremity causes that friction upon the pulley which partially retards the revolution of the bobbin. The friction upon the pulley may be increased, if necessary, by putting the string over one of the hooks, as shewn by dotted lines in fig. 4.

The same mode of retarding the bobbin, by means of a string passed over a pulley, may be adapted to a spinning or roving machine without suspending weights;

a lever or spring may be attached to the end of each string, for the purpose of giving the required tension. This contrivance is shewn adapted to a vertical spindle, in the perspective representation at fig. 5: *a a*, is the spindle with its flyers, actuated by a cord or band, passing from the rotatory drum as usual, and conducted round the pulley, *b*; *c*, is the bobbin, the lower part of which is formed into a cylindrical block or roller; *d d*, is the copping rail, supporting the whole series of bobbins, and which is to be made to rise and fall by the usual contrivances of heart-wheels or otherwise; *e e*, is the friction string, attached at one end to a staple fixed in the copping rail, and brought over the pulley, *f*, from whence it is carried to the bent lever, *g*, touching the periphery of the lower part of the bobbin on both sides as it proceeds, and by that means producing the friction requisite for retarding the bobbin. The lever, *g*, turns upon a fulcrum, and when the string is drawn sufficiently tight, the end of the lever is let into one of the notches in the copping rail and there held fast.

This mode of retarding the bobbins may be otherwise modified, as shewn at fig. 6., where the ends of four bobbins, *a a a a*, are acted upon by one tension string: *b b b*, are three standards, supporting pullies over which the string or endless band, *c c c*, is passed, and also under the tension pulley, *d*, the string pressing against the periphery of the bobbin as it passes from the arm, *e*. Another cord is passed over the tension pulley *d*, and a weight suspended, which holds the tension pulley, and confines the string, *c*, producing that friction which is required for retarding the revolution of the bobbins.

The invention extends further, to a ready mode of placing and displacing the spindles. Fig. 7. shews a portion of a standard or rail, in which one end of the spindle is supported; *a*, is a part of the standard, which falls back

upon a hinge joint; in this moveable piece, there is a socket for the end of the spindle to work in, and when it is necessary to remove one of the spindles, this moveable piece is drawn back, and the spindle taken out, the flap or moveable piece being returned to its place, and held there by the force of the helical spring.

[*Inrolled, February,* 1824.]

To WILLIAM WHEATSTONE, *of Jermyn-street, St. James's, in the County of Middlesex, Music-seller, for his Invention of a Method of Improving and Augmenting the Tones of Piano-fortes, Organs, Euphonons, and other Musical Instruments.*

[Sealed 29th July, 1824.]

The method proposed by the patentee, of improving and increasing the tones of the above musical instruments, is by the introduction of drums, or vibrating surfaces, against which the sounds emitted strike, and are reverberated. These drums are formed, by constructing wooden frames, fitted to the inside of the instruments, and stretching tightly upon these frames, paper, parchment, vellum, or other vibrating material, which produces the drum. The frames are to be placed as near to the sounding boards as possible, in order that the drum may be powerfully acted upon, by the vibration of the note given out on touching the instrument, and the effect is stated to be that of improving the melody, as well as augmenting the strength of the tone.

Apertures are to be made through the cse of the instrument, with trumpet mouths, for the purpose of

permitting the sounds to pass with as little interruption as possible to the ears of the auditors. The adaptation of this invention admits of considerable variation of form and position, dependant upon the character and dimensions of the instrument to which it is applied, and the material employed for constructing the drums may be any membraneous substance, either prepared from animals skins or other substances, which may be rendered elastic.

[*Inrolled, September*, 1824.]

Original Communications.

On the Necessity and the Means of protecting Needy Genius.

In an age when misery, however trifling in extent, and unworthy of compassion, meets always with sympathy, and frequently with relief; when each day affords some new instance of the ready benevolence of the wealthy, to share a portion of their riches with their less fortunate or suffering fellow creatures; it seems strange and inexplicable, that the powerful claims of needy genius should so long have remained *unfelt* and unheeded.

It is degrading to the character of a community, whose wealth and importance is derived from the superiority of its manufactures; but more especially is it a reproach to that portion of it immediately connected with practical science; that the poor but ingenious artizan, the main agent of that superiority, should of all classes be the most unfriended and unprotected.

If we look around us, we see on all sides men upon whom nature has bounteously lavished her strongest

powers, and formed to become valuable member and ornaments to civilization, ineffectually struggling to display their talents, and doomed to poverty and misery by their efforts to render them available, by that irresistible desire which nature firmly implants with them to exert them to some beneficial end. Yet men, who are surrounded by all the comforts and enjoyments of life, and glide through its rugged scenes protected from the rude assaults of the storm, survey with calmness the sufferings of their fellow traveller, heedless alike of his merits and his woes.

It is in vain that we seek a cause for this unexampled and strangely *partial* apathy,—*partial*, for when we see men greedily, as it were, hasten to succour each new disaster; when we see them as eager in their search after some new species of misery, which they may relieve, as though it formed a branch of natural history, or a grand problem of philosophy, we are perplexed to discover, why this alone, apparently one of the first to claim their attention, should be rejected. It is truly astonishing indeed, that the mechanics, who form so large a portion of the population, who are deservedly denominated the *most useful* class of society, and whose welfare is, consequently, so entirely our own interest, should be so blindly and cruelly neglected. There can be no reason that even the most selfish of misers would not blush to assign for this habitual illiberality, there can exist none that benevolence would not reject with disdain. That no powerful appeal has been made to public feeling, that the subject has been but casually before them,* is very far from satisfactorily explaining

* We believe the subject was first advocated by a correspondent in our Journal for Sept. and Oct. 1823, who proposed the formation of a Mechanics' Institution, which has subsequently taken place, see Vol. 6.

it; for it would naturally be supposed, that the most indifferent mention of a cause so fraught with every species of wretchedness, would be sufficient to call forth the warmest sympathy of far less benevolent beings than a British Public!

Not only humanity but self interest call upon us. Let us reflect upon the many valuable acquisitions to science which are lost, through the inability of needy talent to follow up its projects,—on dawning genius, shackled by the oppressive bonds of poverty, obliged to abandon its discoveries in their infancy, and though fitted to become bright luminaries, in the yet untrodden paths of science, crushed in the very outset, from the want of some friendly guide to lead it through its infant troubles. These are but a small portion of the benefits held out for our acceptance—but a small portion of the sufferings of humble talent; but let us remember, that in rejecting the one, we inflict and become answerable for the other. Who can picture to himself the sorrows of the man who has devoted time, health, and property, to the attainment of objects for public benefit: who, prompted by the spur of a powerful genius, has wasted all his energies in striving at some national advantage, and is at length cut off without even an acknowledgment of his services: who would not freely sympathize with his woes, and deprecate the ungrateful neglect of those who have reduced him to this state? Or who can view, without ardently desiring to reverse the picture, the poor mechanic expending all his little wealth in the laudable endeavours to perfect some offspring of his genius, yet deriving from that genius, which should and *might* be a *blessing*, which should raise him to rank and estimation in the world, poverty, misery, and a broken spirit. If we wander with him yet farther in the mazes of his wretched destiny, we shall find him, perhaps, in the midst of all this, encouraged to continue

his labours by some of those despicable and designing villains, who are ever in readiness to take advantage of his forlorn and impoverished condition, (for, however painful and repugnant the thought, there does exist such persons,) and who talk compassionately to the poor man, and feed his famished hopes with soothing and honeyed words, and a long list of promises of reward in fair perspective. Buoyed up once again by the brightening prospect, he returns with renovated vigour to his travail, considering this seemly vista of gilded promises as so much tangible coin already within his grasp, *expence*, which prudence had before denied, is now no longer regarded; (for he is shortly to have the means of discharging every claim,) and, without fear or mistrust, the work is immediately put in hand. His munificent patrons carefully watch the operations, and nourish the hopes they have implanted. He, poor fellow, involves himself some fathoms deep in debt, but exults in the completion of his object. What transport does the poor deluded one experience, when, after days and nights of anxious thought and wearisome application, he has at length arrived at the goal of all his hopes! His heart-strings bound up to the highest pitch of delighted anticipation, he exultingly presents to his worthy benefactors the noble produce of his patient toils, and modestly seeks their approbation. They express themselves beyond measure pleased; extol in superlatives his extraordinary talents, and the great value of his invention; congratulate him upon the FAME he will acquire, and—*promise* a long continuance of *their* PATRONAGE!

This is the liberal reward of all his efforts,—this is the only fulfilment of the false lures held out to him. It is of no consequence that they have induced him to incur debts, which, but for their promises, he would have

honestly disdained to think of—of no moment that they have been the means of blasting his character, and involving him in utter ruin and disgrace. They can now reap the full benefit of his genius, and are satisfied that merit *is its own* reward. But for one act of kindness, though involuntary, he is their debtor: his fondest hopes thus suddenly blasted by their cruelty, the dreadful transition from anticipated wealth to worse than indigence, heavy debt; his honesty questioned; a gaol his only refuge; all kindly combine to crush a frame already enfeebled by exertion, and his anguished heart sinks broken beneath the weight of misery!

Who, that claims the remotest alliance with humanity, will not recoil with horror from such a picture? Who will not be shocked that such a scene could possibly have existence even in the imagination? But this is no child of the imagination—this is no overdrawn tale, dressed out in mimic misery, to work upon the feelings—but alas! the feeble outline only of but too truly existing reality.

James Cross, the unfortunate and injured sufferer, was an humble mechanic at Paisley. At various times he had effected many important improvements in the weaving machinery, used for figured fabrics, which, by his unwearied application, he at length brought to such perfection, as with other great advantages, to render unnecessary the use of draw boys. During the progress of his labours, he was frequently encouraged by the manufacturers of Paisley, who saw and fully appreciated the value of his genius, with hopes of ample remuneration for his persevering application. But when the inventions were pronounced complete, and *more than* his little means had been expended in arriving at this perfection, his only recompence was the high *verbal* approbation of

his munificent and benevolent patrons; and that, too, *after they had been entirely satisfied by actual experience of the great worth of the invention, and were daily reaping benefit from them.* The Board of Trustees for the improvement of manufactures in Scotland awarded poor Cross a hundred guineas, which alone is a convincing argument in his favour; but this liberal gift was sunk in the perfection of his invention, and even then the poor victim was involved in debt. Unable to sustain such a pressure of accumulated misery, his health, previously injured by the privation he underwent to gather the means to prosecute his work, gave way to anguish and blighted hopes; and after more than twelve months lingering in expectation of at least a partial fulfilment of the brilliant prospects which had been held out to him, he died the broken-hearted sacrifice to avarice and base ingratitude, leaving a young, helpless, and motherless family, to inherit his PENURY and his FAME.

> ——— "What man seeing this
> "And having human feeling, does not blush
> "And hang his head, to think himself a man?"

Mr. Cross's numerous inventions form a grand æra in in the history of the art of weaving, and will be admired by posterity when the name and the woes of the humble author will have sunk together to oblivion; but we can here only give a brief outline of them. So early as 1804, he first commenced his observations upon the defects of the machinery then used for weaving, and almost every succeeding year his fertile genius produced some valuable improvement. In 1817-18, he made the first working model of his machine for weaving harness-work without the aid of draw-boys, and submitted it to the inspection of a number of manufacturers and operative wea-

vers, who unanimously spoke of it with the highest encomiums.

This model being on rather a contracted scale, and necessarily imperfect, he was strongly recommended to construct one of larger and more serviceable dimensions, and was given to understand that, his adviser, would cheerfully pay every expense, whether or not his attempts were successful.

Thus encouraged, he proceeded in his labours; but from many untoward circumstances, they this time proved unsatisfactory, after incurring an expense of £18 15*s*. 6*d*. To defray this, as he had been promised, a subscription collected amongst the manufacturers produced £12 15*s*. 6*d*.—leaving him a loser of £6, besides much valuable time. Notwithstanding these losses and frequent interruptions, from his very weak state of health, by persevering industry, during every moment's respite from disease, in 1820, he erected a larger machine. This he submitted to a committee of manufacturers and weavers, who very highly approved the principle, and *warmly* recommended a meeting, to "consider the propriety" of remunerating him.

A subscription, for the purpose of enabling him to prosecute his labours yet farther, was the consequence of this meeting, and the liberal amount of the collection was 16*l*. 7*s*. 6*d*.; from which poor Cross had to pay for wages, &c., upwards of 12*l*. With the residue he was to "*prosecute his labours*," and maintain his family, (then six in number, entirely dependent on him) for five months. Subsequently, being blessed with a short return of comparatively good health, and yet undismayed by the pitiful encouragement he received, he finished another machine of more extended and perfect operation. This also, he laid before committees of weavers and manufacturers. They were now so fully satisfied of his merits, that they this

time gave *written testimonials* of their approbation; (one signed by eighteen, and another by fifteen individuals) and a general meeting was called to *reconsider* the propriety of rewarding him, to which the public were invited, by a circular letter *widely* distributed. At this meeting, a statement* of the poor sufferer's numerous inventions was read, as also the flattering reports of the weavers and manufacturers, who had witnessed the operations of the completed machine; and the weavers were examined, who then had it in actual practice. A subscription again succeeded this parade of mock generosity, and produced the magnificent sum of 3*l.* 1*s.* 6*d.* Such was the noble fulfilment of all the enticing prospects held out to him—all the generous promises, which induced him to sacrifice time and health, which might, and would otherwise have been employed advantageously for himself and family.

In making the numerous experiments necessary to enable him to bring the invention to perfection, he expended and contracted debts exceeding 100*l.* exclusively of the maintenance of his family during the long period that he was so engaged, and for this, the whole recompence he received from the manufacturers amounted as we have shewn, to 31*l.* 14*s.* 6*d.*! He now became but too fully sensible how miserably he had been deluded, and oppressed by all the horrors of debts, which he saw no possibility of repaying: harassed by continual anxiety, both of body and mind, and the bitter

* Extract from the report of the manufacturers, &c., being the statement alluded to:—

"Amongst the many improvements which Mr. Cross has made for the trade, may be mentioned—The Eyed Standard for Gauze Mountings; the Back Hiddles for Pressure Harnesses; the Barrel Machine and Harness; the extending Tail for double Harness, for contracting the flowers, which in many cases, saves nearly one-half the expense of flower lashing, the pressing treddles, not being required as formerly.

"These have all been proved to be of great use."

conviction of his utter destitution, his energies gave way beneath the accumulated mass of woe, his enfeebled body became the prey of sickness, and he sunk into a state of entire helplessness. Thus he lingered, the miserable victim of his own powerful genius, till March, 1824, when, at the early age of 45, he was happily released from further earthly trouble. Previously to his death, he had the satisfaction of seeing his machine generally adopted by the liberal manufacturers, and several gave written testimony* of the great benefit they derived from it. The noble donation of the Board of Trustees came to cheer his latter days also, but it was too late to renovate his worn out frame. But for the real benevolence of one individual, his four orphans (three girls and a boy, the last but six years old,) must have become entirely destitute, and have suffered the very extreme of

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* Extract from testimonies alluded to :—"The counterpoise, harness, and machine, has, in my estimation, a number of decided advantages, too many and important for any commendation on my part. In short, and in truth, I am so highly satisfied with the invention, that I do prefer it to all others for the same purpose, *and even to a draw-boy free of expence.*

Signed, WILLIAM CLARK."

"I shall only add, that I am perfectly satisfied with the machine, in all its departments; that I look upon it to be a highly useful invention, and shall ever feel grateful to Mr. Cross for his important exertion. I can now work when I please, and I am certain at all times of getting the work well executed.

Signed, JAS. FLEMYNG."

"I am ready to declare, without the smallest hesitation, that the machine so completely answers my purpose, that I esteem it infinitely preferable to all others, and would not exchange it for any draw-boy whatever, free of all charges.

Signed, JOHN MACPHERSON."

want. By his humane aid, however, and the employment of the eldest girl as a servent in one of the manufactories, as far as the calls of nature go, they are perhaps as well provided for as many of their neighbours in the same class, but not one of them has yet received *any education whatever*, and unless benevolence again exert itself, there seems no possibility of their ever obtaining it.

Such has been the melancholy fate of one individual, and this one instance, it is hoped, will be thought a sufficiently convincing demonstration of the urgent and crying *necessity*, for the adoption of instant and energetic measures for obtaining a permanent barrier to its recurrence. There is one other tale, however, from the multitude which exist, of which we feel our duty to give a brief notice, since it is that of an individual, who, if possible, has still stronger claims than the ill-used cross upon our liberality and gratitude. We allude to HENRY BELL, who launched the first steam boat on the Clyde. He is now enduring all the bitter privation of poverty, in consequence of his conferring upon us that noble gift. Unable from his scanty resources, to secure to himself by patent right the advantages of his invention, he launched a small vessel to prove the practicability of his plans, trusting that it would repay him the expences he had incurred.

But no sooner did his little boat triumph over wind and waves, and fully demonstrate the grand success of the experiment, than the idea was caught up by men possessing more ample means, and many others vessels of greater magnitude, and more commodiously fitted, were immediately established. These soon superseded his little skiff, and the first projector, who had expended every thing, and incurred heavy debts in proving the truth of his

schemes, and in pointing out to others the high road to wealth, was himself left unnoticed, unpitied, and entirely destitute. Notwithstanding this disappointment, and ill health, from an injury in erecting some machinery, with a perseverance which adds to the lustre of his genius, he is now directing all the energies of his talents to the construction of a steam carriage, which he hopes to find free from the defects which have accompanied all previous attempts. It is sincerely to be hoped, that ere the completion of this, some plans may be devised for securing the benefit of it to the rightful proprietor.

We have here given an imperfect sketch of the disheartening neglect which *needy* genius suffers, and have adduced two examples, selected from the multitude, which but too aptly illustrate the truth of our position, and which we trust will have due weight with those in whose hands the remedy lies. But we have considered *poverty* as the only obstacle to the beneficial exercise of that genius. There is yet another view however of this interesting subject, which, although externally evincing less obvious proofs of misery, is, perhaps, even more disastrous in its consequences; where the *uneducated* mechanic, infatuated with, but possessing an imperfect knowledge of a science, forsakes every useful occupation in pursuit of some chimerical scheme, which eventually leads him to ruin. This is a case of very frequent occurrence, although the details but rarely reach the public ear, and is highly deserving of attention, more especially when accompanied by a natural genius; for daily instances proclaim the danger of such a gift, and how ungovernable its influence, when untempered by a sufficiency of knowledge to calm down its destructive vagaries to patient investigation; left entirely under its uncontrolling dominion, the unscienced projector is continually in

pursuit of baseless schemes, leaving each preceding one, but half digested, to run after some new idea. Frequently deluded by the current notion, that riches await success, he deserts his daily work, and neglects every thing in search of that *ignis fatuus*, perpetual motion, and a patent, obtained from the careful savings of his hard earned pence, proves fruitless and ruinous. It may often happen, however, that his projects have excellent foundations, but thus his want of a few first principles opposes a barrier to their perfection, which, however trifling in itself, becomes only the more perplexing, by his fruitless efforts to surmount it, and causes a ruinous want of time and substance. These are but a few of the cases which throng to the imagination, and which have often been but too sensible realsed: we trust they need no additional argument to enforce the necessity of some means of radical relief. Each day brings some new institution for succouring distress in some hideous form or other; but few indeed could assign more cogent reasons for their formation, and none certainly could find objects more worthy of their benevolence. It were useless to descant upon their well known value. "Their *gains* are the *advantage* of the public, and their *labours* make the *ease* of human life."

Satisfied, therefore, that we have fully established, by living example, the existence of the miseries we have depicted, and consequently the *necessity* of a general co-operation for the suppression of the growing evil, we will proceed to consider the fittest means for the attainment of that end; in the sanguine hope that this humble effort, however unworthy of the cause it advocates, may be but the feeble prelude to the more substantial exertions of others.

(*To be continued.*)

Novel Inventions.

A covering for Houses, &c.

AFTER a roof is shingled or thatched, take hot-pitch, and as you put it on, mix fine sand with it, as much as it will take in. The pitch being laid on hot will fill every crevice, and the sand upon it will make a cement. Should you think one coat not sufficient, you may lay on a second coat: but as far as experience has gone, one coat, well laid on, is sufficient, and will keep the roof secure against beating rains or drifting snows for years.

Refreshing the external appearance of Brick-built Houses.

INSTEAD of washing the brick-work of old houses with yellow, and pointing those parts where the mortar appears, it is proposed to rub the face of the bricks with a rasp, or other rough implement, which will remove the dirty external surface, and give to the house the appearance of a new erection. This process has been resorted to with very good effect by Mr. Snowden, of Oxford-street, and the cost is very much less than that of washing and pointing, as heretofore practised.

To Soften Crude or Cast Iron.

TAKE two parts of quick lime, and one of alumine, or common fine clay, mix them with water to the consist-

ency of thick paste. Spread this mixture over the iron to be softened, about one-eighth of an inch thick for small pieces, a little thicker for large. Place the iron so prepared, in an iron case with a cover, which must be luted at the joints so as to exclude the air: place the same in a furnace, and heat it to cherry redness; then cover it with the hot ashes of the fire, and let it remain till cool; it will then be softer than common wrought iron.

To make Paper Carpets as a substitute for Oil Painted Floor Cloths.

TAKE linen or cotton, cut it to the size of the floor you intend to cover, sew it together: if cotton, wet it, and having pasted the floor all round, (about a hands' breadth from the skirt-board, strain it and fix it by the paste. When the cloth thus fixed is dry, lay on it one or more coats of strong paper, and finish by covering with hanging-paper, of whatever quality or figure you please, and border the same according to fancy. Center, corner pieces, &c. may be laid corresponding with the border, according to the taste of the manufacturer, or that of his customer. There is no absolute necessity of laying other than the paper which forms the pattern of the carpet on the cloth; for the coat or coats of strong paper, above mentioned, between the muslin and the pattern of the carpet, is solely for the purpose of strengthening the carpet and contributing to its durability. When the carpet is thus far prepared, and the paste which has been used in attaching the paper and muslin together is quite dry, give it two coats of glue, or such size as is made from

the shreds of skins, and used by the carvers and gilders; which glue or size must always be put on as warm as possible; great care must be taken that no part of the paper is left unsized, otherwise the varnish (hereafter described) will sink into the paper and spoil it. When the size thus laid on is perfectly dry, give the carpet one or more coats of boiled oil; and when dry, one or more coats of copal or any other varnish, according to the degree of polish or lustre that may be required. The copal and other varnishes are liable to crack, in which case water or any other fluid may penetrate to the oil, but will be prevented from doing further injury to the carpet, by the oil, which cannot crack, and will prevent either water, or any change in the atmospheric air from affecting the size which separates the varnish from the paper. There is no absolute occasion for any other varnish than boiled oil. The carpet, however, will require more time to dry, when covered with several coats of boiled oil, than when partly coated with boiled oil, and partly with varnish. To floors that are tight, smooth and even, fancy paper, linen or cotton, may be pasted on the bare boards, and will wear extremely well. They are however liable to two objections—the joints of the boards will be seen through them; and should the boards shrink, the paper carpet will break at the joints.

The above carpets are portable, and may be made at the manufactory to fit any room, by taking the dimensions thereof. Those carpets that have many thicknesses of strong paper will require hammering to smooth the joints of the paper. The carpet may be made without the assistance of any kind of linen or cotton, by pasting paper to painted boards; when, by repeated coats of

paper, it is become strong and firm, it will forsake, or may be separated from the paint, and will be as durable as if mounted on linen or cotton.

The above described carpets may have two faces, or different surfaces, by pasting paper to both sides of the linen, cotton or paper, and pursuing the process above described. Carpets made of linen, cotton or paper, or composed of all three, that are intended for halls, passages, or other places much exposed to wet, should be oiled on the under side, and well varnished upon the upper one; the edges should also be bound with leather, or some other strong substance, and well oiled, to prevent water, rain, mud, &c. from penetrating the paste. The paste used in the preparation of the paper carpets, ought to be very strong, (perhaps the best or strongest is to be procured by substituting beer or sweet wort for common water.) The paste must be kept free from lumps; and when taken from the fire, stirred until it is cold. Papers used for carpets must have, in the printing or stamping them, sufficient gum or size to enable them to stand the effects of the warm size mentioned above. The papers may be printed in oil for these carpets, by giving the paper a strong coat of size upon the back, which will prevent the oil from penetrating the paper, otherwise it cannot be pasted to linen, cotton, or any thing else: one edge must be left untouched by the oil for the lap, and white lead must be substituted for whitening in the compound of colours. Paper thus prepared and printed or stamped, will not require any size between the colours and the boiled oil, as before-mentioned.

When these paper carpets become soiled, they may be cleaned in the following manner:—1st They must be swept clean, then wiped all over with a damp spunge or cloth; they may then be wiped over with sweet skimmed

milk, which will refresh them very much. When they require to be re-varnished, clean them as above, then wipe them with lime water to take off the grease, and varnish them as often as you please. When they are totally defaced, wash all over with a ley of potash, which will destroy the former varnish. They may then be sized and varnished in the same manner as before described, and the colours will be as fresh as when first laid down. Whenever they are removed, they ought (if varnished only on one side,) to be rolled with that side out, to keep the varnish on the stretch to prevent its cracking. The brush for sizing the above carpets, may be like a white-washer's, only thicker, and as long in the handle. The brush to varnish with should be the size of about three pound brushes, fixed to a long handle. It is found by experience that japan varnish is the best for the above carpet.

Polytechnic and Scientific Intelligence.

Astronomical Society.

April 8.—A paper was read, "On the results of computations on astronomical observations made at Paramatta, in New South Wales, under the direction of Sir Thomas Brisbane, K. C. B.; and the application thereof, to investigate the exactness of observations made in the northern hemisphere. By the Rev. John Brinkley, D. D. F. R. S. &c." Anxious to throw some

new light on the subject of discordance between the north polar distances of the principal fixed stars, as determined by Continental and English astronomers, Dr. Brinkley wrote to Sir Thomas Brisbane, to request his Excellency to make some observations at Paramatta. Sir Thomas immediately commenced the important labour; and on a series of three months' observations, from November, 1823, to February, 1824, communicated to this Society, as well as to Dr. Brinkley, the Doctor, has founded the computations and comparisons which are communicated in this paper.

The sum of the polar distances of a star observed in the two hemispheres ought to be exactly 180°, if both are correctly observed. Also, on the hypothesis that the mean refraction is the same in both hemispheres, we have an opportunity of ascertaining the united effects of refraction, instead of the difference between the refraction of a star near the pole and of a circumpolar star remote therefrom.

In regard to the distance between the north and south poles, by combining Dr. Brinkley's observations with those of Sir Thomas Brisbane, the result is that the mean of 141 south polar distances deduced from 141 of his observations, and applied to Dr. Brinkley's north polar distances = 1700° 59′ 58″,92 or 1″,08 *in defect*. Dr. Brinkley's refractions were applied to the southern observations, using the *interior* thermometer. The same mean, obtained by using Mr. Bessel's north polar distances, and computing by Mr. Bessel's refractions (*Astron. Fundam.*), using the *exterior* thermometer, is 180° 0′ 1″,72 or 1″,72 *in excess*.

1. Among the observations are some by reflection, These afford us the means of determining the zenith point

and thence the distance between the zenith and polar points, or the co-latitude.

Co-latitude by *Canopus*	56° 11′ 8″,63	
——— *Sirius*	9,16	
——— *Fomalhaut*	9,95	
Mean	= 56 11 9,25	
Latitude	= 33 48 50,75	

2. The results of observations on *both* the solstices of 1822 appear to show the latitude of Paramatta = 33° 48′ 42″.—(No. 37, *Der Ast. Nachrichten.*)

The observations of the Dec. solstice of 1821 give the mean zenith distance of the solstitial point, Jan. 1, 1822, =10° 21′ 2″,23—(No. 20, *Der Ast. Nach.*)

The mean obliquity of the ecliptic, taking the mean obliq. of Jan. 1, 1816, = 23° 27′ 49″,21 and secular diminution = 48″ } =23 27 47, 06

Latitude 33 48 49, 29

If we use Mr. Bessel's obliquity = 23° 27′ 45″,66 the latitude will be = 33° 48′ 47″,89.

The result of all the observations shows that Dr. Brinkley's *constant* of refraction (57″,72) is as exact as can be desired, when the refractions are computed by the *internal* thermometer; also that when computed by the *external* thermometer, Mr. Bessel's refractions require no correction worth notice.

A communication was also read from Colonel Beaufoy, inclosing a series of observations of Jupiter's satellites, at Bushey Heath, near Stanmore, between April 1816 and and December 1824; and another series of observations of solar and lunar eclipses, and occulations of stars by the Moon, occurring in the same interval of time, from

1816 to 1824 inclusive. The eclipses of Jupiter's satellites are so recorded as to show the mean time at Bushey, mean time at Greenwich, and then the same as exhibited in the Nautical Almanac. The discrepances between the results of observation and the Nautical Almanac are in some cases very considerable. Even with regard to the *first* satellite, the differences sometimes exceed a minute and a half in time; and with regard to the other satellites, the differences exceed 2, 3, 4, and in one case, (July 15, 1818) *seven* minutes of time. In this case the discrepance is the same with respect to the *Connaissance des Tems*. The others the reporter has not had leisure to compare.

The reading of Mr. Atkinson's paper on refraction was also resumed and continued.

Abstracted Report of the Select Committee of the House of Commons, on Machinery and Artizans, &c.

(Continued from page 274.)

Messrs. Donkin, Bramah, Taylor, Maudsley, and Hague, further examined.

Mr. Maudsley stated, that if our exportation laws were altered, we should be enabled to compete with the manufactory at Liege, and there is no doubt but that our business would greatly increase. They have now what price they please for their machines, being the only established manufactory of the kind; if we were to send our machines at 50 per cent. profit, they would sell on the continent, as they are getting 100 per cent. by the Flemish machines.

Mr. Donkin thinks the demand would increase, because, when in Germany last year, he received orders for several hundred pounds worth of articles, in consequence of the badness of their cast iron, the materials for making machinery being both cheaper and better in England; their machinery is in general 25 per cent. dearer than ours.

There used to be an amazing trade in pig iron from this country, but the French government refuse to take it unless we let them have machinery also; they do not wish to be engineers, but manufacturers. They have not only laid a duty of 20 per cent. on pig iron, but will only receive it in such pieces as weigh eight hundred weight, which, from their inconvenience, amounts almost to prohibition, and compels them to use their own inferior iron. The defect in their iron arises principally from their imperfect mode of smelting, which is generally done with wood instead of coal. At the Liege manufactory, they have an immense colliery within their premises. One of Mr. Cockerell's brothers has a large manufactory established at Berlin, for making machinery to dress cotton and wool.

Mr. Cockerell, the elder, had a patent for his machinery; and so great was the demand at first, that he was frequently offered 1,500 francs for what he only charged 1,000: that is, fourteen years ago.

Mr. Hague has been four or five months at a time in the manufactories at Liege, Aix la Chapelle, and Vervais; he stated that a good workman is hardly to be got there, unless he is from England; has no doubt we should supply the machinery they make if our laws would permit us to export.

Mr. Taylor stated, that Mr. Cockerell is allowed to import, duty free, such parts of machinery as he can procure from this country; and as his demand greatly exceeds his capability of manufacture, there is no doubt, if our laws were altered, that he would be a considerable customer.

Many furnaces in France have been given up, in consequence of the scarcity of fuel; but that never can take place with us: indeed, our facilities for manufacturing are a hundred to one before theirs.

Mr. Donkin considers, that the want of canals in France is a great impediment to the conveyance of machinery from one part of the country to another, and that, if we do not supply them with such heavy articles, they will be compelled to create the means of conveyance. Mr. Taylor being asked, if the progress of mechanical improvement in France would not keep pace with us, replied, that he considered there is the same relative distance between the improvements of the two countries that there was fifty years ago, and he thinks we shall still maintain our superiority: the habits of our people are favourable to improvement—those of the French are not; they have had enormous difficulties to contend against in the establishment of their manufactories, which would not have occurred here. By the want of machinery they have been, in many instances, compelled to create it, and have thereby acquired that skill which they would not have possessed if we had been permitted to supply them. If the French were to increase their import duties, that would not exclude English machinery, as smuggling and bribery is carried on there to a great extent.

The publications of all the scientific bodies in this country, as well as periodicals, with plates of mechanical inventions and copies of jurolled specifications, are allowed to go to the Continent, and good workmen can there make the machines from the descriptions given. The prohibitary law has another bad effect—if a foreigner wishes to know what is going on in any particular manufactory, he meets the workmen and bribes them, which

naturally undermines their honesty. The laws may, therefore, be considered as a dead letter—they have no other effect than to prevent the manufactories of this country from making a considerable quantity of machines, from which they would derive a handsome profit.

Four or five years back, the engineering business was extremely dull; at that time all the idle hands might have been fully employed, had not the prohibiting laws existed—all the witnesses concurred in this opinion. Some of the latter volumes of the Society of Arts' Transactions contained improvements in cotton machinery, which may readily be added to the machinery existing.

The inducements for a working mechanic to go to France and Germany, are generally a bounty of ten or fifteen guineas, and a promise of three guineas per week when he gets there. Mr. Donkin knew a paper-maker, who used to earn eighteen or twenty shillings per week here, but was engaged to work in France at fifty shillings per week. These engagements, however, are not faithfully abided by after the men get there, and they would gladly return, but having transgressed the British laws, are in fear of punishment; beside this, their passports are generally deposited with their employers, and not knowing the language or practice of the police, consider themselves confined there.

New Patents Sealed, 1824.

To Robert Hicks, of Conduit Street, in the county of Middlesex, surgeon, for his invention of an improved bath—Sealed 22nd of March—6 months for Inrolment.

To Francis Ronalds, of Croydon, in the county of Surrey, Esq. for his invention of a new tracing apparatus to facilitate drawing from nature—23rd March—2 months.

To Richard Wilty, of the town of Kingston upon Hull, in the county of the same town, and of Sculcoats in the county of York, civil engineer, for his new invented improvement in the method of lighting by gas, by reducing the expences thereof—25th March—6 months.

To John Martin Hanchelt, of Crescent Place, Blackfriars, in the city of London, and Joseph Delvalle, of White-cross Street, in the parish of St. Luke, in the county of Middlesex, Esq. in consequence of a communication made to them by a certain foreigner residing abroad, for an improvement or improvements in looms, for making cloths, silks, and different kinds of woollen stuffs of various breadths—25th March—6 months.

To Joseph Manton, of Hanover Square, in the parish of St. George, Hanover Square, in the county of Middlesex, gun-maker, for his invention of a certain improvement in shot—25th of March—6 months.

To John Gotlieb Ulrich, of Bucklersbury, Cheapside, in the city of London, chronometer maker, for his invention of certain improvements on chronometers—25th of March—6 months.

To Aaron Jennins and John Belteridge, both of Birmingham in the county of Warwick, manufacturers and japanners, for their invention of certain improvements in the method or methods of preparing and working pearl shell into various forms and devices, for the purpose of applying it to ornamental uses in the manufacture of japan ware, and of other wares and articles to which the same can be applied—29th of March—6 months.

To Richard Roberts, of Manchester, in the county of Lancaster, civil engineer, for his invention of an improvement or certain improvements of, in, or applicable to the mule, billy, jenny, stretching frame, or any other machine, or machines, however designated or named, used in

spinning cotton, wool, or other fibrous substances, and in which either the spindles recede from, and approach the rollers, or other deliverers of the said fibrous substances, or in which such rollers or deliverers recede from and approach the spindles—29th of March—6 months.

To James Haumer Baker, of the Island of Antigua, but now residing in St. Martin's Lane, in the county of Middlesex, gentleman, for his invention of certain improvements in the arts of dyeing and callico printing, by the use and application of certain vegetable material or materials—29th of March—6 months.

To Maurice de Jongh of Warrington, cotton spinner, for his invention of an improvement or improvements in spinning machines, and preparation machines, generally called mules, jennies, slubbers, and any other machine to which his invention may be applied, whereby much labour, hitherto done by hand, is performed by machinery—29th of March—6 months.

To Edward Sheppard of Uley, in the county of Gloucester, clothier, and Alfred Flint of the same place, engineer, for their new invented series of improvements in machinery, for raising the wool or pile on woollen or other cloths, by points, by which the process is much facilitated, and a great saving effected, and part of which improvements are also applicable to brushing, smoothing and dressing such cloths, to the great benefit of the public—29th of March—2 months.

To Thomas Parkin, of Bache's Row, City Road, in the county of Middlesex, merchant, for his new invented mode of paving, in a certain manner, parts of public roads, whereby the draft of waggons, carts, coaches and other carriages is facilitated—29th of March—6 months.

To Rudolph Cabanal, of Melina Place, Westminster Road, Lambeth in the county of Surrey, engineer, for his

invention of certain improvements on engines or machinery for raising water, part of which machinery is applicable to other useful purposes—30th of March—6 months.

To John Heathcoat, of Tiverton, in the county of Devon, lace manufacturer, for his invention of certain new or improved methods of figuring or ornamenting various descriptions or kinds of goods, manufactured from silk, cotton, flax, or other thread or yarn—31st of March—6 months.

To Jacob Jeddery Fisher, of Ealing, in the county of Middlesex, Esq. for his new invented application of railways, and the machinery to be employed thereon—2nd of April—6 months.

To Simeon Broadmeadow, of Abergavenny, in the county of Monmouth, civil engineer, for his apparatus for exhausting, condensing or propelling air, smoke, gas, or other aireformed products—2nd of April—6 months.

To William Turner, of Winslow, in the county of Chester, saddler, being one of the people called Quakers, and William Mosedale, of Park-street, Grosvenor-square, in the county of Middlesex, coach-maker for their new invented improvements on collars for draught horses—2nd of April—2 months.

To Robert William Brandling, of Low Gosworth, near Newcastle-upon-Tyne, Esq. for his invention of certain improvements in the construction of rail roads, and in the construction of carriages to be employed thereon and elsewhere—12th of April—6 months.

To William Shalders, of the city of Norwich, leather-cutter, for his new invented gravitating expressing fountain, for raising and conveying water or any other fluid for any purpose—12th of April—2 months.

To William Gillman, of Whitechapel-road in the county of Middlesex, engineer, and James William Sowerby of Birchin-lane, in the city of London, merchant, for their invention of certain improvements in generating steam, and on engines to be worked by steam or other elastic fluids—13th of April—6 months.

To Thomas Sunderland of Croom's-hill Cottage, Blackheath, in the county of Kent, Esq. for his invention of a new combination of Fuel—20th of April—6 months.

To Charles Ogilvy, of Verulam Buildings, Gray's-inn, in the county of Middlesex, Esq. for his invention of an improved apparatus for storing gas—20th of April—6 months.

To John Broomfield, of Islington, near Birmingham, in the county of Warwick, engineer, and Joseph Luckcock, of Edgbaston, near Birmingham, aforesaid, gentleman, for their invention of certain improvements in the machinery or apparatus for propelling vessels, which improvements are also applicable to other useful purposes—20th of April—6 months.

To Lemuel Wellman Wright, of Wellclose-square, in the county of Middlesex, engineer, for his invention of certain improvements on the machinery or apparatus for washing, cleansing, or bleaching of linens, cottons, and other fabrics, goods, or fibrous substances—20th of April—6 months.

D.	H.	M.	S.	
1	7	0	0	☿ in conj. with η in Taurus.
2	0	0	0	☿ Stationary.
2	2	59	0	Ecliptic opposition or ○ full moon.
3	9	0	0	☾ in conj. with δ in Scorpio.
4	19	0	0	☾ in conj. with B in Oph.
6	11	53	9	♃'s 3d Sat. will emerge.
6	12	0	0	☾ in conj. with ο in Sag.
6	14	0	0	☾ in conj. with π in Sag.
6	18	0	0	☾ in conj. with δ in Sag.
6	12	10	13	♃'s 2nd Sat. will emerge.
9	9	21	0	☾ in □ last quarter.
10	12	0	0	♃ in conj. with δ in Cancer.
11	5	0	0	☿ in conj. with ♂ long 25° in Taurus ☿ lat. 6′ N. ♂ lat. 9′ N. diff. lat. 3′
12	9	49	22	♃'s 1st Sat. will emerge.
14	20	0	0	☾ in conj. with η in Pisces.
16	21	0	0	☾ in conj. δ in Aries.
17	12	6	0	Ecliptic Conjunction or ● New Moon.
17	17	0	0	☽ in conj. with ♀ long. 44° in Taurus ☽ lat. 1° 54′ N. ♀ lat. 2° 57′ N. diff. lat. 1° 03′.
17	17	0	0	☽ in conj. with ♂ long. 44° in Taurus ☽ lat. 1° 54′ N. ♀ lat. 13′ N. diff. lat. 1° 41′
18	1	0	0	☽ in conj. with ♄ long 10° in Gem. ☽ lat. 1° 35′ N. ♄ lat. 1° 29′ S. diff. lat. 3° 04′
18	6	0	0	☽ in conj. with 2η in Taurus.
20	4	0	0	☽ in conj. with η in Gemini.
20	8	0	0	☽ in conj. with μ in Gemini.
20	22	13	0	☉ enters Gemini.
21	1	0	0	☽ in conj with ζ in Gem.
23	4	0	0	☽ in conj. with 2α in Cancer.
23	23	0	0	☽ in conj. with ο in Leo.
24	8	0	0	☽ in conj. with π in Leo.
24	18	51	0	☽ in □ first quarter.
26	0	0	0	☿ Stationary.
28	5	0	0	☽ in conj. with ι in Virgo.
30	19	0	0	☽ in conj with δ in Scorpio.
31	11	53	45	Beginning } Eclipse of the Moon.
31	11	58	0	Ecliptic opposition or ☉ full moon. } Eclipse of the Moon.
31	12	8	30	Middle. } Eclipse of the Moon.
31	12	23	0	End. } Eclipse of the Moon.

The waxing moon ☽ — the waning moon ☾

Rotherhithe. J. LEWTHWAITE.

Errata for April.

D. H. M. S.

For 19 20 50 0 ☉ enters Aries, *read* enters Taurus.

— 35 22 0 0 *read* 25 22 0 0

METEOROLOGICAL JOURNAL, MARCH AND APRIL, 1825,

1825.	Thermo. Higt.	Thermo. Low.	Barometer +	Barometer —	Rain in inches.	1825.	Thermo. Higt.	Thermo. Low.	Barometer. +	Barometer. —	Rain in inches.
MAR.						APR.					
26	55	32	30,00	29,90		10	66	38	—,16	station	
27	55	31	29,98	—,93		11	68	42	—,08	—,02	
28	54	30	—,96	station		12	62	42	—,03	29,96	
29	51	35	—,90	—,87		13	56	44	—,08	—,92	
30	46	38	30,03	—,92	,025	14	66	40	30,02	station	,025
31	52	32	—,25	30,16		15	67	42	—,10	30,06	
APR.						16	68	42	—,04	station	
1	52	35	—,37	—,31		17	54	40	—,16	—,10	
2	59	25,5	—,37	—,36		18	52	30	—,13	—,08	
3	61	33	—,27	—,20		19	57	26,5	—,10	—,08	
4	63	36	—,17	station		20	62	31,5	—,06	—,00	
5	62	28	—,20	—,17		21	65	43	29,93	29,76	
6	57	33	—,25	station		22	61	45	—,59	—,58	,1
7	59	34	—,27	—,26		23	63	47	29,44	station	,2
8	69	34	—,29	station		24	59	48	—,39	station	,175
9 ½	63	29,5	—,18	—,14		25	62	43	—,83	station	,375

CHARLES H. ADAMS, LOWER EDMONTON.

LITERARY NOTICES.

Fine Arts.—A View of Rotterdam, in the line manner, by Mr. G. Cooke, from a picture painted for the Earl of Essex, by R. W. Callcott, R. A. has just been published, and is the first of a series to be engraved from the paintings of the above artist. If we are to form an opinion of the proposed work, from the beautiful execution of the one before us, we may very truly congratulate the lovers of the Fine Arts on the prospect of a publication calculated to do honour to the British school.

Danish Literature.—A work has lately been published, at Copenhagen, on the Character, Manners, Opinions, and Languages of the Peasants of the northern part of the Island of Zealand; by M. Jurge. Report speaks of this performance as being a very curious book, not only on account of the novelty of the subject, but also in consequence of the able manner in which the author has treated it. There is an Appendix to the work that must render it eminently useful to the students of the languages of the North, which is a Dictionary of the dialect of the peasants of that country.

Mr. Penn has in the press a new and improved edition of his Comparative Estimate of the Mineral and Mosaical Geologies. It will form two vols. octavo.

Mr. Phillips, the horticulturist, author of Pomarium Britannicum, and various other works, has announced shortly for publication a new work, on which he has been long engaged, to be entitled, "Floral Emblems," containing, together with an account of the most beautiful picturesque devices employed in ancient and modern times by celebrated painters and poets, a Grammar of the Language, &c. It will be comprised in 1 vol. illustrated with plates.

The Emperor of Russia has lately purchased nearly two hundred Arabic, Persian, and Turkish MSS. for the Library of the Imperial Academy at St. Petersburgh.

A work is announced in 1 vol. duodecimo, as forthcoming, by Joseph Astley, entitled Observations on the System of the Patent Laws, with Outlines of a Plan proposed in substitution for it.

Colonel L. J. Napier is preparing a Memoir on the Roads of Cefalonia, with Plans for their defence; to which is added, a Statistical Account of the Islands, with averages as to Climate, &c.

Preparing for publication, by J. B. Taylor, F. S. A. Bishopswearmouth, Flora Fossilis; or, a Description of the Fossil Vegetable Remains found in the Coal Districts of Durham and Northumberland; with a particular account of the Concomitant Stratification.

Mr. Barlow's Magnetical Discoveries.—The Emperor of Russia has presented Mr. Barlow, of the Royal Military Academy (through his Excellency Count Lieven) with a valuable gold watch and rich dress chain, as a mark of the value which his majesty places upon the magnetical discoveries of that gentleman, and on their important application to the improvement and security of navigation. We are glad also to add, that the East India Board has followed the example of the Admiralty and Trinity Boards, and presented Mr. Barlow with the sum of two hundred pounds. Mr. Barlow, not having availed himself of a patent right for his correcting plate, is justly entitled to these marks of public acknowledgement.

The Society of Russian History and Antiquities, founded at St. Petersburgh in 1802, has just published the second volume of the Memoirs of the Society; and among the articles therein contained are, an interesting Memoir on the subject of the Russian Coin; a scientific notice on the Ensign of Prince W. Ladimir, on the Gate of Horsun, at Novgorod, &c. The existence of similar societies, in the different Capitals of the North, has been announced by several public journals; and from the total want of a National History, hitherto so strongly felt by the inhabitants of that quarter of the world, seems to have given rise to an enterprising spirit of research after the national antiquities of the country.

Captain Franklin, Dr. Richardson, and their party, arrived at New York on the 16th ult. in four weeks from Liverpool.

LONDON:
SHACKELL AND ARROWSMITH, JOHNSON'S-COURT, FLEET-STREET.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. LIV.

Recent Patents.

To JOHN ARROWSMITH *of Air-Street, Piccadilly, in the County of Middlesex, Esq. in consequence of Discoveries by himself, and Communications made to him by certain Foreigners residing abroad, for an Improved Mode of publicly Exhibiting Pictures or Painted Scenery of every Description, and for Distributing or Directing the Day-light upon, or through them, so as to produce many beautiful effects of Light and Shade; which he denominates Diorama.*

[Sealed, 10th February, 1824.]

THE invention on which this patent has been bestowed, is, in its picturesque effects, so well known to the public, that we need scarcely offer a remark upon its merits as a first rate work of art: but it is to be remembered, that the subject of the picture presented to view, and the skill of the artist who painted it, are both to be considered as

distinct and apart from the invention of the Diorama, which is a novel method of exhibiting painted scenery in the day-time, by a peculiar mode of directing the light and shade upon or through the picture, by means of moveable screens intercepting the light of windows behind, and sky-lights above.

The patentee has, in his specification, given a ground plan of the building in the Regent's Park, near London, where his pictures are now exhibiting under the name of the Diorama; but as the form of the building in which such scenery might be shewn, would necessarily vary under circumstances, it will be sufficient if we give a vertical section of the amphitheatre and stage, shewing the manner in which the light is thrown upon the scene, and occasionally intercepted by darkened or coloured screens.

Plate XIII. fig. 1, shews a section of the interior of the building, with one of the pictures exhibiting; *a*, is the amphitheatre where the spectators are situated, one side of it being open, for the purpose of shewing the scene: the aperture to which is surrounded by partitions, or opaque screens, fixed, to confine the view, much in the same way as the proscenium of a theatre; *b*, is the painted picture, distended upon a frame, or by weighted rollers hung from the top of the building; *c c*, are dotted lines shewing the extreme limits of view allowed to the spectators. The scene being transparent, receives the principal part of its illumination from the large window, *d*, behind; between this window and the picture any number of coloured screens, *e e e*, may be suspended by cords, so as to cast different tones of shade upon any particular parts of the scene; and by moving these screens, the light may be thrown upon or gradually withdrawn from the picture, to represent the effect of passing clouds, storms, &c. The colours of the several screens are of course to be such as will throw the

desired tint upon the scene; and these are to be made of thin silk or cotton, dyed.

Such parts of the picture as require to be illuminated on the front side, are to receive their light from windows or sky-lights, *f*, in the roof of the building. These windows are also to be furnished with shades or screens moving upon hinges, for the purpose of throwing more or less light upon the whole or any part of the picture in front. These shades or screens must also be made of coloured silk or cotton, for the purpose of transmitting tints suited to the scene exhibiting. The whole of the screens are suspended by cords passing over pullies; and instead of being moved by hand, it is proposed, when their positions are adjusted, to connect the ends of their cords to a lever or moving arm attached to the side of the building, but not shewn in the figure; when, by turning a winch, certain wheels and pinions will be made to draw the screens slowly into the situations required for changing the direction and effect of the light.

As two different subjects are exhibiting in the same building, and it is necessary that they should remain stationary, instead of leading the company from room to room, it has been contrived, by a particular arrangement of the building, that the proscenium of each picture shall open into the circular amphitheatre. It is therefore necessary that the seats and all the spectators, with the interior of the amphitheatre itself, should be moved round slowly and imperceptibly, by which means the view of one picture closes as the other opens; and this change is repeated from time to time during the whole of the day, leaving ten or fifteen minutes for the examination of each scene.

The mode by which the spectators are carried round will be seen in the section of the building; *g g g*, is a strong frame-work of timber, which turns round upon a pivot, *h*,

at bottom; upon this frame-work the floor and seats which support the spectators are erected, and from it also the sides of the amphitheatre rise; these are suitably bound together and to the floor; and at top, an iron frame, extending from the circular cornish, meets in the middle, and holds the upper pivot, *i*, which works in a beam of the roof. By this contrivance, a small power exerted by a man underneath, at the winch, *k*, causes the whole to turn; *l l*, are wheels running upon a circular bed of level masonry, for the purpose of supporting the superstructure, and taking off the friction as it turns. To the under side of the frame-work a segment of a circular rack, *m*, is affixed, concentric with the pivots on which the whole moves; into this rack a bevelled pinion upon the upright shaft, *n*, gears, and by turning the winch, as above said, the train of wheels connected to the shaft and pinion causes the amphitheatre to move slowly round, so as to turn the spectators from one scene to the other, and back again.

The interior of the amphitheatre may be fitted up in any tasteful way,—either with festoons of drapery or by paintings; the circular ceiling of the Diorama now exhibiting is transparent, illuminated by sky-lights in the roof; but that forms no essential part of the invention, the patentee confining his claims of originality to the new mode of throwing day-light upon or through painted scenes, and of varying the brilliancy of the light, as well as giving different tones and tints to the picture, by the intervention of several screens or shades of different colours.

[*Inrolled, August*, 1824.]

To Charles Anthony Deane, *of Charles-Street, Deptford, in the County of Kent, Ship Caulker, for his Invention of Apparatus or Machines to be worn by Persons entering Rooms or other places filled with Smoke or other Vapour, for the purpose of extinguishing Fire, or extricating Persons or Property therein.*

[Sealed, 20th November, 1823.]

The apparatus which constitutes the subject of this invention is a helmet of copper, with a garment attached to it, to be put over the head and shoulders of a person going into any place which is on fire, or filled with smoke and deleterious vapours. At the back part of the helmet, the end of a long leather pipe or hose is attached; which pipe extends out of the building to the open air, where it is to be connected to bellows, for the purpose of forcing fresh air into the helmet, to enable the wearer to breathe; and also from the back part of the helmet another pipe proceeds, for the purpose of allowing the air to escape which is expelled from the lungs in breathing.

Plate XIII. fig. 2, shews the manner in which the apparatus is used; fig. 3, is a section of the helmet, for the purpose of pointing out more clearly its particular construction. The helmet itself is proposed to be made of sheet copper tinned, the parts being all accurately joined by rivets, or brazed; at the lower part there is a flexible roll or collar, *a a*, made of any soft material, which is designed to lay close to the neck of the wearer, for the purpose of supporting the weight of the copper helmet. To this collar the garment is attached, which is to be made of some close but flexible material, such as leather or cloth rendered air-tight; and straps are placed in such conve-

nient parts as will allow of its being tightly bound to the body and arms, so as to prevent the passage of smoke or other injurious vapours to the interior of the helmet.

Windows of glass, *b*, are made in the front part of the helmet, for the wearer to look through, and which are guarded by small bars. The back part of the helmet is made double, for the purpose of forming a passage, *c c*, for conducting the fresh air into the helmet; and at the lower part, the pipe, *d*, is attached, which brings the fresh air. Opposite the mouth, a circular slide valve, *e*, is placed in the helmet, similar in its construction to the valves of some air stoves, which may be opened by turning the button in front, where the air will be admitted to the mouth and nostrils of the wearer; but on closing this valve, all communication with the surrounding external atmosphere is cut off.

The bellows for forcing pure air into the helmet is proposed to be placed in a box, *f*, (see fig. 2,) on the outside of the building, to which the pipe or hose, *d*, is to be connected; this box is intended to contain the whole of the apparatus when packed together, and which by those means is made portable. The construction of the bellows, *g*, within the box, is not new or very peculiar; double bellows is proposed, for the purpose of effecting a continued blast of wind; and the mode of working it is by means of a small lever, as shewn at *h*, which may be actuated by any person assisting on the outside.

Supposing property of considerable importance and value to be in any particular part of premises which are on fire, and it is impossible to gain access to that part of the premises, without passing through dense smoke, or an otherwise deteriorated atmosphere, a person intending to rescue that property puts on the helmet, and straps the garment close, which may be done in a very few minutes;

the end of the pipe is then to be attached to the bellows, and with a lighted lanthorn affixed in front, and suitable implements in his hands for the purpose of breaking open doors, &c. he enters the premises, as shewn at fig. 2, having the slide valve in front of the helmet open, that he may be enabled to breathe freely and call out if necessary. As soon as he finds the smoke or other vapour to inconvenience him, he gives notice for the person without to put the bellows in action; he immediately closes the slide valve, *e*, and derives the whole of the air for respiration from the pipe.

The cold air thus injected passes through the pipe, *d*, into the narrow passage, *c*, at the back of the helmet, from whence it distributes itself by several openings, and enters the helmet against the glass windows, *b*, by which means the breath is prevented from condensing upon the glass, as it would otherwise do, and obstruct the sight of the wearer. In order to prevent the possibility of the pipe, *d*, being collapsed or closed by the falling of a beam, closing of a door, or other accidental circumstance, so as to stop the passage of the air, a rope is conducted through the whole length of the pipe or hose which keeps the passage open. The air expelled from the lungs in breathing escapes from the helmet at the pipe, *i*, which is passed under the garment, and opens near the ground, for the purpose of preventing the smoke and deteriorated air from passing up into the helmet. In this manner a person may be enabled to breathe freely, though surrounded by an atmosphere which would not support respiration: the apparatus, besides, is so light and conveniently adapted to the body, that very considerable physical exertions may be performed by the wearer, under these circumstances of difficulty and danger, and he may be enabled to remain sufficiently long in this situation to remove and rescue property of great value or importance.

The patentee lays claim to the invention of the helmet

and its attachments, but not to the other parts of the apparatus, excepting as adapted and employed for the purposes above stated.

[*Inrolled, April*, 1824.]

TO JEAN HENRY PETELPIERRE, *of Charton-street, Somers Town, in the Parish of St. Pancras, in the county of Middlesex, Engineer, for his new invented Engine or Machine for making the following articles from one piece of Leather, without any seam or sewing whatever: that is to say, all kinds of Shoes and Slippers, Gloves, Caps and Hats, Cartouche-boxes, Scabbards and Sheaths for Swords, Bayonets, and Knives.*

[Sealed 20th March, 1824.]

THE patentee proposes to split, partially, pieces of thick leather in such peculiar manners, that they may be enabled to be opened and pressed upon a block, so as to assume the shape of the article intended to be formed, without attaching any of the edges of the leather by sewed seams. To effect these objects, a machine is employed, with certain appendages, shewn in plate XIII.

Supposing a shoe or slipper is the article about to be made, it is proposed to take a piece of thick sole leather, and cut it into the shape shewn at fig. 4. which may be done by an ordinary knife, or by a peculiarly formed cutting tool, forced through the leather by a screw press. A groove is then to be made across the piece, as at *a a*, penetrating half through the leather; and when that is done, the piece is to be placed upon the table of the machine, having

a model of the sole laid upon it, and fastened down by screwed clamps. The machine is shewn in side view at fig. 5, and top view at fig. 6; the end of the table being moveable upon its hinge joints, for the purpose of placing it at such an angle to the horizon as will be best suited to the convenience of the workman, which is done by a screw, and a sliding support underneath. The tool which holds the splitting-knife is then placed upon the table, and the operation of splitting commenced.

This tool is shewn edgeways at fig. 7, and a top view at fig. 8. It consists of a long piece of metal, *c*, with a rib, *d*, on the under side to keep it level, a pin, *e*, to move in the long slot, *f*, of the table, *b*, which acts as a guide, and two arms, *g g*, intended to slide upon the table and keep the tool even. At *h* the cutter or knife is affixed, and *i* is a guide to limit the action of the knife, which is adjustable by screws, and the whole is moved by the handle, *k*.

The piece of leather out of which the shoe is to be formed, with the model of the sole, *j*, upon it being fastened down upon the table, as above said, and shewn at fig. 6; the cutting-tool is then placed upon the table, its pin, *e*, acting in the slot, *f*. The handle, *k*, is now to be moved to and fro, so as to make the knife penetrate the edge of the leather at half its thickness, which it continues splitting until the guide, *i*, comes against the edge of the model of the sole, *j*, and prevents the knife from penetrating further. The piece of leather, with the model, is now to be turned round, and again fastened to the table, and the other edge split by a similar movement of the knife, leaving the middle part of the leather solid, something larger than the shape of the model.

The piece of leather is now to be placed in a vise as shewn at the reverse end of the bench fig. 5, for the purpose of bending it back at the groove, *a*, when it is to be

hammered down until it assumes the form of a right angle. To complete the shoe the moveable part of the table, *b*, first employed, must be withdrawn, and another similar to fig. 9, substituted in its stead, which is also to be attached by hinge joints. The half of the piece of leather intended to form the fore part of the shoe is now to be laid upon this table, the heel part hanging down in the space between the hinge joints and there confined by a screw, and a cutter, with a differently formed guard, is to be used; the guard being intended to act against the inner part of the curve, *n n*, fixed on the table, instead of the mould above described.

The cutter being properly adjusted and placed upon the table as before, the piece of leather is now by a similar operation divided from the inside, that is, from the groove *a*, towards the toe, separating a portion of the solid part of the sole, and also splitting that part of the leather which had been previously cut away. When this has been done the piece is to be withdrawn, and another table with a groove suited to receive the heel part attached, in which the reverse end of the piece of leather is to be placed and confined, and then split in a similar way from the groove towards the heel.

The substance of the piece of leather being now divided, as shew in section at fig. 10, it may be pulled open and drawn over a last, when by wetting and rubbing down it will assume the form of the foot, and after being dried, the edges may be shaved down and the superfluous leather pared away, leaving the slipper as shewn at fig. 11. It may then be curried or otherwise dressed and finished, and will be perfected without a single seam or stitch.

In a similar way gloves, caps, hats, cartouch boxes, scabbards, and a great variety of other articles may be formed from solid leather, without sewing, by shaping the

piece of leather in the first instance to a suitable figure, and then employing such cutting knives, guards, and moulds, as will by the mode and apparatus above described, split the leather into the desired forms.

[*Inrolled May*, 1824.]

To EDWARD SCHMIDT SWAINE, *of Bucklersbury, in the City of London, in consequence of a Communication made to him by* FREDERICK ADOLPHUS AUGUSTUS STREEVE, *of the City of Dresden, Doctor of Physic, and* EDWARD SWAINE, *of the City of Leipzig, Merchant, (on whose behalf he is soliciting this Patent) for an Invention of a Method of Producing and Preserving Artificial Mineral Waters, and for Machinery to effect the same.*

[Sealed 9th October, 1823.]

ARTIFICIAL mineral waters are made by impregnating pure water with the minerals of which they are desired to partake, but that which the patentee appears to have particularly in view, is to impregnate pure water with carbonic acid gas, or what is commonly called fixed air; this is usually done by liberating the gas from chalk, marble dust, and other such substances by means of sulphuric acid, and afterward forcing that gas mechanically into water, which produces the effervescent draft generally sold at the shops as Seltzer Water.

This impregnation of pure water with carbonic acid gas has been heretofore effected by various kinds of apparatus differing in construction, but not in principle: the invention however under consideration, consists of one

complete series of apparatus for effecting the process from beginning to end, which is exhibited in Plate XVI. at fig. 1, *a*, is a vessel of lead, in which the patentee proposes to introduce lime water and other ingredients for generating the carbonic acid gas; *b*, is a small vessel of a funnel form, into which the sulphuric acid to be employed in the process is to be put, a conical stopper being inserted in the bottom of this funnel. When the vessel, *a*, has been charged with the lime or other similar substance and water, the stopper is to be drawn up, and the acid allowed to pass into the vessel below, where the gas begins immediately to generate. In order, however, to assist the operation, a revolving fan or agitator within the vessel is to be put in motion by means of the winch, *c*. The gas thus generated rises up the syphon pipe, *d*, and descends into the purifying vessel, *e*, where, after passing through a purifying solution of barytes, for the purpose of taking up the acid, the gas rises in bubbles and passes into the gas-holder, *f*, where it may be considered to be stored for use.

From the gas-holder, *f*, the gas proceeds through the pipe, *g*, to the meter, *h*, which is for measuring the quantity passed, and is constructed upon the principle known or called Clegg's gas meter. Here, after passing round through the revolving chambers, and causing the quantity to be registered by the counting apparatus, the gas proceeds along the pipe, *i*, to the air-pump.

The air-pump *k*, is firmly fixed upon a wooden frame, and is intended to be put in operation by means of a revolving crank; *l*, is a fly-wheel, turned by a winch or otherwise, upon the axle of which is a pinion that actuates a toothed-wheel, *m*; to the side of this wheel *m*, the crank-rod, *n*, is attached, and by its rotation the crank movement is given, which causes the piston of the pump, *k*, to

alternate. The gas thus brought into the pump by the pipe, *i*, is forced up into the chamber, *o*, from whence it proceeds through the pipe, *p*, to the impregnating vessel, *w*. The chamber, *q*, is merely intended to hold water for the purpose of acting against the back of the piston in the air-pump, to diminish its friction; *r*, is a barometer, placed upon a stand, intercepting the pipe, *p*, by which means the pressure of the gas is at all times seen; *s* and *t*, are two chambers standing over the impregnating vessel, with which they communicate by tubes, the orifices being closed by conical valves; in these chambers any fluid chemical compound may be placed, which may be intended to give flavour to the factitious water in the vessel below.

Pure water being placed in the vessel, *w*, the process of impregnation is commenced by first generating gas in the vessel, then, after allowing it to pass into the gas-holder and through the meter, to force it by means of the air-pump into the vessel, *w*. The water in this vessel is to be frequently agitated by means of the winch, *u*, upon the axle of a rotatory beater, and when sufficiently impregnated the artificial Seltzer water thus made is to be drawn off through the pipe, *v*, into the bottle, *x*, which bottle is raised up to the cock of the pipe, *v*, and its mouth brought in close contact with a collar of leather round the cock by the foot of the person attending pressing up the lever, *y*. After the bottle has been filled the cock is closed, and a cork instantly introduced and made fast by a piece of wire bound over it.

The apparatus is fitted at all points with such contrivances as render it convenient, and easy of adjustment, as well as for the purpose of clearing out and replenishing with water and other materials. The several parts of the machinery are not, we presume, claimed as new, but

the whole so combined, and for the purpose above stated, constitute the subject of this patent.

[*Inrolled, April*, 1824.]

To Edward Jordan, *of the City of Norwich, Engineer, for his Invention and Discovery of a certain Improvement or Improvements, in the Form or Construction of Water Closets, or of the Apparatus connected therewith.*

[Sealed, 27th March, 1824.]

The improvements which constitute the subject of this patent, are designed to make water-closets what may be called self-acting, that is, to force a quantity of water into the pan, for the purpose of washing away the soil as soon as a person rises from the seat. This object may be effected, by adapting the new contrivance in several different ways; but that mode which the patentee prefers, is shewn in Plate XVI. at fig. 3.

The pan or basin, *a*, with its valves enclosed in the box *b*, and the discharge pipe, *c*, are not intended to vary from their usual construction in ordinary water closets; the improvements being in the parts about to be described; *d*, is a pipe leading from a reservoir of water above; from this pipe the water is intended to flow through the stop-cock, *e*, into a cylindrical vessel, *f*; *g*, is a pipe leading from the stop-cock, through which the water from the cylindrical vessel flows into the pan, the cock, *e*, having three ways.

It is proposed that the seat of the water-closet, shall be made to sink an inch or two when sat upon, in which case the rod, *h*, placed under the seat, will be made to descend, and to force down the shorter arm of the lever,

i; by this means the longer arm of the lever, *i*, will be raised, and with it the rod, *k*, connected to the lever or arm of the stop-cock, *e'*; hence the plug of the cock will be turned round a sixth part of a revolution, opening the way of the pipe, *d*, and closing the way of the pipe, *g*; at this time the water will be enabled to flow from the reservoir above, through the pipe, *d*, and the cock, *e*, into the cylindrical vessel, *f*, which it will fill by the super-incumbent pressure of the descending column, *d*, excepting that portion of the cylinder occupied by the compressed air.

On the person rising from the seat of the water-closet, the force of the spring, *l*, acting upon the longer arm of the lever, *i*, will depress it, and thereby bring the seat, the rod, and the plug of the cock, *e*, into the situation shewn in the drawing: when the way of the pipe, *g*, being opened, and that of *d*, closed, the elastic force of the compressed air in the cylinder, *f*, will expel the water therefrom with considerable force, and inject it into the pan, for the purpose of washing away the soil through the valve, and stink-trap placed at bottom, in the box, *b*, as usual.

The patentee suggests, that several variations of this contrivance may be made, such as moving the lever and cock by a handle attached to the rod, *h*, instead of a sinking seat: he, however, wishes it to be understood, that he does not confine himself to the precise mode of effecting the movement; but claims particularly the introduction of the three way cock, in the manner and for the purpose above explained.

In such cases as when the reservoir of water cannot be placed sufficiently high, to give the necessary force to the descending column, so as to compress the air in the cylindrical vessel, it is proposed to raise the cylindrical vessel about five feet above the seat, in order that the force of the water in descending, may have the same

effect as when injected by the elasticity of the compressed air. And it is further proposed, to enlarge the ways of the cock, that the force of the water may not be impeded; which is done by lengthening the socket that the plug acts in, and instead of making the apertures round or oval, as in ordinary cocks, to form them oblong, and extended as wide as the socket will admit of.

[*Inrolled, September,* 1824.]

To John Leigh Bradbury, *of Manchester, in the County Palatine of Lancaster, for his Invention of a new Mode of Twisting, Spinning, or Throwing Silk, Cotton, Wool, Linen, or other Threads or fibrous Substances.*

[Sealed 3d July, 1824.]

This new mode of twisting, spinning, &c. is stated to be an improvement upon certain machinery, for which the same inventor obtained a patent in the year 1816. The first object is to cause the action of any pair of delivering rollers, in a spinning frame, to cease the instant that the thread, which is conducted from those rollers, breaks away from the bobbin of the spindle. This precautionary measure is designed to prevent a very great waste of the material operated upon, when the machine is not properly attended to. The second is to effect the throwing or twisting of silk threads in a machine, called a mule, in the same way that cotton and other fibrous substances are spun.

In Plate XVI. fig. 4, is a representation of the me-

chanism connected with the spinning of one thread; the whole series which constitutes the spinning machine being merely a repetition of similar parts placed along the frame, their motions being effected simultaneously by the prime mover; *a*, is the thread proceeding from the copt to the delivery rollers, *b c*; the thread is passed round the top roller, *b*, to a hook, and thence proceeds between *b* and *c*, towards the flyer and spindle; *d*, is one of the set of the bottom rollers, of which there are a series coupled together, and actuated by a pinion at the end of the machine; upon the axle of each of these rollers, *d*, a toothed wheel is fixed, which takes into a similar toothed wheel, upon the axle of the roller, *c*; by these means the rotation of the roller, *d*, causes *c* to turn, and the upper roller, *b*, bearing upon the periphery of the roller, *c*, turns also by friction, drawing the thread, *a*, from the copt, and delivering it, as shewn in the figure.

The thread thus proceeding from the delivering rollers, passes through an eye in the weighted lever, *e*, to the bobbin upon the spindle, *f*: actuated by the cord and drum shewn by dots; and, when the thread is drawn tight by the revolution of the flyer, the weighted lever, *e*, is, by the pressure of the thread, kept nearly in a horizontal position, as shewn in the figure, but when the thread breaks, the longer arm rises by the descent of the weighted end; *g*, is a shaft extending along the front of the machine, which is made to revolve constantly; upon this shaft are cross arms, which, while the lever, *e*, remains nearly horizontal, pass freely without touching it; but in the event of the thread breaking, the longer arm of the lever immediately rises, and the cross-arm of the shaft, *g*, comes in contact with the shorter arm or weighted end, by which means the lever is forced almost into a perpendicular position; when an inclined plane, attached to the lever, pushes back

the standard, *h*, which carries the roller, *c*, in its forked arms at top, and lifts the small toothed wheel, *c*, out of gear with the wheel on the axle of *d*, and the action of that set of delivering rollers ceases until the broken thread is again replaced.

The second part of the invention is the adaptation of the ordinary mule to the twisting or throwing of silk. Fig. 5, represents the manner by which this operation is affected; *a*, is an end view of the carriage, and *b*, is the copt of silk upon its spindle, which is made to revolve by a cord passing from a drum over the small pulley, *c*. One of the bobbins containing the silk to be twisted, is shewn at *d*: several of these bobbins are to be so placed, that the filaments of silk proceeding from them shall meet and become united between the guide roller, *e*, from whence they proceed to the spindle, and are there twisted; *f*, is a weighted lever, with a small rod or wire, *g*, at the end, which extends along the machine, and when the carriage has run out so far as to have drawn a considerable length of silk, and it has become twisted by the rapid rotation of the spindle, then the action of the lever causes the rod, *g*, to bear down upon the thread, and guide it on to the copt, which takes it up as the carriage returns, exactly in the same way as in the ordinary mule spinning of cotton.

[*Inrolled, September,* 1824.]

To William Ainsworth Jump, *of Middlewich, in the County of Chester, Salt Proprietor, and* William Court, *of Manor Hall, also in the County of Chester,* Esqs. *for their Invention of an Improved Method of Manufacturing Salt.*

[Sealed 15th June, 1824.]

The improvement herein proposed in the making of salt

consists in heating the brine in a pipe or tube, passed through furnaces previously to introducing it into the evaporating pans where the salt is to be concentrated. The general construction of the pans are not intended to be different from those salt pans in ordinary use, one of which is shewn in Plate XVI. at fig. 2.

The pan, *a*, is a shallow vessel of metal, presenting a considerably extended surface; it is to be erected upon brickwork, and supported by brick walls passing under it; *b*, *b*, *b*, *b*, are the entrances to furnaces, which are to be employed for heating the pan: these have ash pits under them as usual; *c*, *c*, is a pipe or tube extending from an elevated vessel or reservoir of brine, and passing through the several furnaces, which pipe supplies the pan with liquor. There is a stop cock in the pipe, at *d*, for shutting off the liquor, and when the cock is closed, the brine contained in that part of the pipe which passes through the furnace, becomes heated to a boiling temperature, which, by preparing the brine, greatly facilitates the process of concentration.

On opening the stop cock, *d*, the superincumbent pressure of the liquor in the reservoir above, forces that which had previously occupied the pipe, out at its bent extremity, from whence the liquor descends into the pan in a boiling state, and therefore does not check the evaporation. When a sufficient quantity of salt has become concentrated, it is to be collected in the usual way, and removed from the pan; and the stop-cock being again opened, a fresh supply of brine is admitted into the pan, and the process goes on as before.

It is to be understood that the improvement consists in the introduction of the pipe *c*, *c*, passing through the furnaces, and in the employment of this pipe as a feeder, by

which means the process of concentrating the salt is greatly facilitated.

[*Inrolled, August,* 1824.]

To William Pontifex, *the younger, of Shoe-lane, in the City of London, Copper-smith and Engineer, for his new Invented or Improved mode of Adjusting or Equalizing the Pressure of Fluids or Liquids in Pipes or Tubes, and also an Improved mode of Measuring the said Fluids or Liquids.*

[Sealed 1st July, 1824.]

This invention is divided into three subjects, first an improvement upon existing machinery for adjusting and equalizing the pressure of fluids, which is particularly adapted to the emission of gas for illumination, and is designed to regulate the force with which the gas shall be discharged through the burners: secondly, another modification of the same principles, applicable to regulating the discharge of water through pipes or tubes: and thirdly, to the construction of gas meters, for measuring and regulating the quantity of gas passed through the apparatus in a given time.

Plate XVII. fig. 2., shews the mode of adapting this contrivance to equalize the discharge of gas, by a section of the apparatus, all of which is to be placed under ground; *a a*, is part of a gas main, in which *b* is an opening or vertical pipe; *c c*, is an inverted vessel similar to a gasometer, the lower part of which, is immersed in water, occupying the channel in the box, *d d*, round the pipe, *b*, the upper

part of the box receiving air through the lateral pipe, which extends upwards to the surface of the ground. The vessel, *c*, is suspended by a chain to a lever, *e*, and balanced by a weight at the reverse end. To the centre of the inside of the vessel, *c*, a rod, *f*, is attached, which descends perpendicularly and passes through holes in the cross bars, for the purpose of guiding its ascent and descent. The lower part of this rod, *f*, is bent, and to the rod is affixed a plate or disc, *g*, falling into a recess below, which is designed to close the passage of the pipe, *a*, partially or entirely, according to circumstances.

The gasometer, *c*, being adjusted to a certain pressure by weights laid upon its top, gas is allowed to pass through the main, *a*, and as long as it does not exceed that pressure required for the regular discharge at the burners, the apparatus is not brought into action, but as soon as the gas begins to exert an additional force, the vessel, *c*, rises, and with it the rod, *f*, and the plate or disc, *g*, by which means the passage through the main becomes partially closed, and the gas is only allowed to proceed through the contracted aperture, and of course its pressure at the burner is brought down to the requisite discharge. When so much gas has been consumed as shall have reduced the pressure, the gasometer, *c*, descends again, and the plate or disc, *g*, sinks into the recess, leaving the way of the main unobstructed.

The second modification of the invention, which is for regulating the discharge of water, is shewn in section at fig. 3; *a a*, is the water pipe or main under ground, in which *b* is a valve of a disc form, turning in a vertical direction upon pivots by the rising and falling of the lever, *c*. This lever is moved by a jointed rod *d*, attached to the underside of the float *e*, which ascends and descends in the upright tube, *f f*. When the pressure of the water in the pipe, *a*, is too great, it will cause the float, *e*, to rise, which by means of the rod, *d*, and

arm, *e*, turns over the valve, *b*, and partially closes the aperture or water way.

Attached to the upper side of the float, and to the flange round the top of the tube, is a flexible leather bag, by which the water that may insinuate itself past the float is prevented from acting against its upper surface. On the top of the float a rod is fixed which slides through a guide into the open air tube, *g*, and *h h* are several weights suspended by cords from the cap or cover of the tube, *f*, for the purpose of pressing upon the float. One, two, three, or more of these weights are brought to bear upon the float as the increased pressure of the water raises it up in the tube, and by these means the valve, *b*, is partially closed so as to retard the course of the water through the pipe, *a*, in proportion to its pressure, and which prevents it from flowing with undue force through the cock at the exit.

The third contrivance is a meter for measuring the quantity of gas passed through a pipe in a certain space of time, and for indicating that quantity by a counting machine and dial. Fig. 4 shews this apparatus enclosed in an air-tight box; *a* and *b* are two inverted vessels, acting in water tanks, *c* and *d* similar to gasometers. These vessels are suspended by chains to the ends of a vibrating beam, *e e*, which moves upon its fulcrum in the standard, *f*.

A pipe, *g*, conducts gas from the ordinary gas-holder, which pipe has two arms, *h* and *i*, passing through the water tanks, and opening respectively into the inverted vessels *a* and *b*.

The gas is now to be supposed passing from the pipe, *g*, up the arm, *h*, and discharging itself above the water into the vessel, *a*, which accordingly rises in the tank, *c*, the vessel, *b*, at the same time descending in the tank, *d*, by its own gravity. When the vessel, *a*, is full and raised to its greatest altitude, it is necessary that the mouth of the pipe

h, should be closed; this is done by a tappet upon the side rod, *k*, within the tank, coming against an arm extending from the end of a balance lever, *l*, and thereby raising it. This lever is hollow, and contains a quantity of mercury, which, when one end is raised, flows to the reverse, and causes it to fall with considerable force upon the end of the lever, *m*, from the extremities of which the conical valves or stoppers are suspended. By these means the conical stopper is brought into the mouth of the pipe, *h*, and is there held down by the preponderating weight of the ball on the lever, *m*, and closes the aperture. The conical valve at the reverse end of the lever being at the same time raised from the mouth of the pipe, *n*, the gas which occupies the vessel, *a*, is allowed to escape through the pipe, *n*, and to discharge itself into the outer vessel or square box, from whence it proceeds through the exit passage, *o*, at the top.

In a similar way the mouth of the pipe, *i*, is now opened and the gas passing through it, raises and occupies the vessel, *b*, which, when filled, discharges itself by the pipe, *p* into the outer vessel. Thus the progress of the gas cause the lever, *e*, constantly to vibrate, and knowing the cubica contents of the vessels, it is only necessary to indicate by a counting machine how many vibrations have occurred, any the quantity of gas passed through the machine will be immediately known. For this purpose an axle may proceed from the vibrating lever to the outside of the box and be there connected to a counting machine, or the dial may be seen through a glazed aperture.

[*Inrolled December* 1824.]

To James Rogers, *of Marlborough, in the County of Wilts, Surveyor, for his new-invented, improved method, or improved Instrument or Instruments, for determining or ascertaining the Cubic Contents of standing Timber*

[Sealed 20th March 1824.]

The method herein proposed for ascertaining the cubic contents of standing timber, is by taking observations at a certain distance from the tree, and determining by means of a mathematical instrument, both the vertical and horizontal angles subtended from that spot, between the several points of the tree about to be measured, and then reducing the measure of the tangents of these angles, by means of tables or by calculation, so as to obtain the solid contents between the several parts so observed.

The improved instrument, proposed to be employed for this purpose, is shewn in Plate XVII. Fig. 1. It is planted upon a tripod stand, in the same manner as a theodolite, and has, or should have, similar adjustments. An upright stem arises from the top plate, at the end of which is a ball, with a hole perforated through it, to receive the horizontal stem of the instrument; *b c*, may be called the base limb of the instrument, which is to be placed in a truly horizontal position, and adjusted by the suspended level, *d*. The limb, *e*, rises on a joint at *c*, and slides upon a vertical arch, *f*, which is graduated. At the joint, *c*, there is an eye-piece, through which the surveyor looks along the side of the bar, *b*, to a small point, or rising edge at the end of the bar; the part of the tree cut by this line of observation will, if the instrument is properly adjusted, be perfectly horizontal with the eye-piece.

An eye-piece is also placed at *c*, on the upper side of the rising limb, for the purpose of looking along this limb to a point or rising edge, *e*, in its extremity. The surveyor elevates this limb, until that part of the tree intended to be noticed, is exactly cut by the line of observation, and the angle subtended between that and the horizontal is shewn upon the vertical arch, *f*.

It is here to be remarked, that the graduations upon the arch, *f*, are not angles of altitude, but marks or graduations answering to feet and inches of a tangent line, extending from the horizontal point upwards, taken at a given distance from the tree; consequently there are two or more rows of divisions, answering to the several distances at which the instrument may be planted. Twenty-four feet and forty-eight feet are proposed distances, and the graduations upon the arch, *f*, are made accordingly. For lofty trees the longer distance is to be used; but for shorter trees, the distance of twenty-four feet will be sufficient.

The horizontal angles which are to determine the diameter of the trunk, at the several points of observation, are ascertained by the limb, *g*, which slides laterally upon an arch or graduated plate, *h*, divided upon the same principle as the arch, *f*. The limbs, *b* or *e*, being fixed, so as to coincide with one side of the trunk, the limb, *g*, is then moved until it coincides with the other side of the trunk, and the angles subtended between the two, shews by the graduated plate, *h*, the diameter in feet and inches of the trunk at the points of observation.

The length of the trunk, and its diameter in the several parts being thus ascertained by the improved instrument, recourse must then be had to tables, calculations, or the ordinary sliding rule, for the purpose of obtaining from these admeasurements, the solid content of timber in each portion of the tree. There are adjusting screws, and cir-

cular racks, and pinions for moving the limbs of the instrument, and altering their position, as circumstances may require; and when crooked arms, or bent parts of the trunk present themselves, the instrument may be turned upon its pin, in the ball at the top of the stem, *a*, and used in an inclined position.

[*Inrolled, September*, 1824.]

Original Communications.

On the Necessity and the Means of protecting Needy Genius.

(Continued from Page 319.)

To the Editor of the London Journal of Arts, &c.

SIR,

UPON a conspection of the foregoing facts, it appears that the means of relief must embrace the following objects:

1. To give opportunity to talent, oppressed by poverty, of freely exerting its powers.

2. To aid it, where necessary, by such instruction as will nourish and develope those powers, temper them with steadiness, and conduce to expose the fallacy of visionary schemes and mistaken principles.

3. So to protect the produce of that talent, that its possessor may derive adequate benefit therefrom.

In the consideration of this proposition, it will be expedient, perhaps, first, to enquire what plans have already been proposed or attempted towards the accomplishment of its objects; and, then, to examine into the most appropriate and practicable means of supplying what may be deficient.

We find the distresses of ingenious mechanics first pointed out, with a view to their removal, by a correspondent in the *London Journal of Arts;* where a society was proposed as the most eligible means of relief; and some plans were offered for its general conduct.—As these, however, seem to extend rather beyond the reach of practice, and as we shall have occasion, in another place, to consider more at large the constitution of a society appropriate to our purposes, we will not here enter into their merits. One of the minor periodicals has since espoused the cause with some degree of warmth, but objects to this plan of a society as being "too open to innovation;" suggesting, in lieu, an extension of the laws of patent, so that their protection might be placed within the reach of the most humble. As far as we can understand this proposal, it seems to be the modelling of our patent laws somewhat after the continental systems: and we will, therefore, state the objections which, upon this interpretation of it, instantly and forcibly strike us. In the first place, it is scarcely possible that a monopoly for the short space of two, three, or five years, even if obtained entirely free of expence (as we presume is intended), should remunerate the labours and expence incurred in perfecting the most trifling invention; for the brief protection would expire before any improvement, (we speak of *mechanical* improvements) however easy of adoption, could be brought into general use: both from the time which must necessarily elapse before it becomes sufficiently known, and before the manufacturer would be sufficiently convinced of its utifity, to lay aside his old machinery. This must alway be the case with every new invention in machinery; for, while the manufacturer finds his present means tolerably perfect, he is averse

from any change, unless compelled to it by competition or other incentives.

2. The effect of such a short term of the Patent right would be, to induce a great portion of those who required it to await its expiration, that its benefits might be derived at a cheaper rate. And, 3. the *poor* inventor, being still *unfriended*, would be as far as ever from deriving emolument, or advantage of any kind, from his talent: for *his patent would be open to the piracies of all who chose to to take advantage of his poverty and defenceless state*, (and there are many who would do it), without a possibility of his obtaining redress.

But, even did these objections not exist, this plan offers but a very partial remedy.—It provides only for *completed* inventions; whereas the *poor* artizan needs a *friend*, whom he may consult, and confide in; not only to obtain protection or reward for what he has been able to bring to perfection, but for assistance in maturing the fruits of the observations he may have made in practice; and for the attainment of that knowledge, which may enable him to make them correctly, and expose any erroneous projects he may contemplate. He must not only be *rewarded for inventing*, but *assisted to invent;* and what could so well fulfil these duties, as an association of individuals, having the interest of distressed genius truly at heart? It is objected that it would be "open to attack and innovation." The "Official Board of Invention," proposed by those who thus object, would be equally so. Each plan must have its "Board:" and both, to "determine upon the merits and intrinsic value" of projects submitted to them, must consist of men of science. But the members of the *Official* Board would have no interest in its proceedings beyond the punctual discharge of their official duties;

and we cannot presume that, where a mutual and general interest does not exist, the business would be conducted with strict propriety. Such, it appears to us, would be the effects of this institution; and we confess that, for such a purpose, we are not favourable to any alteration of the patent laws: for when we consider the scrutiny and revision which they have undergone, the abilities, time and care which have been bestowed upon their construction and improvement, and still find them, in many respects, imperfect, we think that it would, at least, be but a hazardous and doubtful experiment. Wise and cautious as these laws undoubtedly are, and notwithstanding the jealousy with which they view all kinds of monopoly, yet have they no means of discovering whether the subjects of the applications for their protection be really new.

Consequently we see, time after time, letters patent given to *several persons for the same discovery*, and for things with which all the world have been acquainted for ages previous. The specification, it is true, is open to public inspection; and if the claim be unjust, the individuals aggrieved by it, may seek their remedy.—But, what is that REMEDY? An action at LAW! One patentee must seek its aid to set aside the encroaching claims of another; and they who find the instruments of their daily labour, thus constitute the sole property of another, must also resort to it, and incur its host of cares and expenses to relieve themselves from the burthen; or, by continuing the use of their own property, become subject to an action for infringement.

The existence of this evil is far from dubious: a reference to the specifications enrolled, in one year only, will furnish proofs sufficiently numerous and decisive. It is apparently impossible that the numerous demands for

patents, should be subjected to that rigid examination which would be requisite to determine the validity of their claims to originality: for those to whose care it is confided, can scarcely be supposed to be acquainted with every existing invention; neither would it be possible to examine all that might have been previously enrolled; and were scientific men appointed to inspect the pretensions, they would be considered as interested judges. Thus it seems the evil must ever exist: the only check upon its growth is that oppressive, but, for this cause, perhaps necessary, *tax upon ingenuity*, the enormous expence attendant upon letters patent. Were this removed or lessened, applications for (and *consequently* grants of) letters patent would be multiplied to a pernicious extent; and in like manner would the evils of inconsiderate grants encrease.

The Society of Arts has an imposing name, a large revenue, and annually puts forth a printed book of premiums offered and conferred: whence it might be (and, by those who judge by outward appearances, it is) inferred that it is a powerful support of needy talent: but it evidently could have afforded no adequate remuneration to either of the sufferers whose cases we have narrated. Indeed, farther than the encouragement it affords to little girls and boys who are learning to draw, we can see no manner of good that is to be derived from it. It is obviously impossible that it can reward inventions of any *real* value; and it is as evident that no such inventions will be offered for their acceptance: for where can we expect to find the man who will forego the advantage of a patent, for a premium, which will not repay him the expenses he has incurred, and which, in many instances, is not an equivalent for the model required by the Society, or even for the trouble and expence of dancing

attendance upon their long and protracted deliberations: certainly not among those who seek to *profit* by their exertions: the annual list of premiums proposed, forms a most amusing contrast to the subjects claiming them, and the rewards actually bestowed. Judge the Society by the one, and we shall place it high in the number of the useful institutions of Europe; by the other, and it will sink to a level with the most insignificant. We select from their book the following premium, which has appeared for several successive sessions, and may be esteemed a fair specimen of the whole:—"No. 244. To the person who shall invent and produce to the Society, a machine for raising coals, ore, &c. from mines, superior to any hithero known, or in use, and which shall produce the effect at less expense—the Gold Medal, or Fifty Guineas." This, to be "*superior to any thing hitherto known or in use*," must be superior to the *steam engine*; and the inventor is to resign the advantage of a Patent, and furnish the Society with a Model, for *Fifty Guineas*—and the *honour*—(we had almost forgotten this important feature)—of receiving the same at their hands!

There is another, for a method of preventing explosions in gunpowder mills, to obtain which, certificates of one or more such mills having been set on fire *with safety*, must be produced. The others are, for the most part, as absurd, and we are in no way surprised that these do not appear in the list of rewards conferred.

A Society possessing such extensive funds, might, if properly directed, become of considerable utility; but under the present regulations, it is worse than useless, and of course, therefore, can in no way aid our present views.

Connected with this portion of our subject, are two joint stock companies, which we observe advertised under the

titles of "The British and Foreign Patent Association," and "The British Invention and Discovery Company;" both purposing, amongst other objects, to afford to poor inventors the means of obtaining patents. We have not seen any detailed explanation of their views, and cannot, therefore, form any opinion of their probable utility; but we should apprehend, that a society, whose only object is to *profit* by the ingenuity of others, can scarcely be the *friend* we are in search of for the needy artizan.

Thus far, the practised or proposed plans which we have considered, have related entirely to the *remuneration* of the ingenious mechanic: and we believe that we have collected all that has been recently done or said upon the subject. We now come to that important point—his *education.*

The London Mechanics' Institute is the only means for this end which exists in the metropolis. We do not consider it possible, however, for any institution of this nature to be entirely supported by those for whose benefit it is framed, without exacting a far larger portion of the poor mechanic's pence than he can well spare; and thus, in a great measure, defeating one of this institution's principal views—"to improve the condition of the working classes." The London Mechanics' Institution is by no means a fair example to cite *against* our argument, as it has been established and supported by the large donations of individual generosity. Take these from its funds, leaving it the contributions of the members only, and it evidently would assist *us* to prove *our* side of the question: for numerous as the members now are (and it is to be expected that the number will diminish after a time) they could not possibly support the heavy expenditure at present incurred:*

* The first report of the Edinburgh School of Arts says,—"It is conceived that, looking forward to the time when the ardour of novelty

This society has been the subject of such various and conflicting opinions, which in many instances have been advocated with all the acrimony of party feeling, that we are afraid that many of our readers will scarcely give us credit for an unbiassed discussion of the subject. Those, however, who, like ourselves, profess no party in politics, and *therefore* (for it follows as a corollary) no party in this question, will, we trust, concur in our opinion, that, under its present administration, this institution is, if not altogether *useless*, at least more abundant in harm than good.

The original purposes of this institution were benevolent and highly useful—" The instruction of the members in the principles of the arts they practice, and in the various branches of useful knowledge;" but it is its misfortune to have been from its birth under the conduct of men of strong party prejudices, and the *instruction* has, consequently, savoured very much of this particular branch of knowledge. The worthy President, in his inaugural address, alluding to observations of this nature, which had thus early gone abroad, disclaimed " all intention of interfering with political questions," and for himself, we know that he spoke with sincerity; but, nevertheless, how rapidly, through the aid of his associates, did the society become the tool of a party! Liberty and independence were the themes of every harangue, and a violent party spirit pervaded every meeting;* the mechanics were kindly told how unjust the laws

shall have cooled, properly qualified teachers can only be obtained by a remuneration which will render the situation an object of ambition to a well educated man, and that to keep the fees low, which is quite essential, *there must be, either by subscription or other means, an additional source of revenue.*"

* Vide the speeches at the opening of the Institute, and those of Brougham, Hume, Torrens, &c. at the Anniversary Dinner.

of their country were towards them—the questions of catholic emancipation and parliamentary reform were there tolerated, patronized, and applauded; and ere long we find one of its supporters openly avowing these principles, and strongly recommending the introduction of lectures upon controversial divinity and politics! We allude to a pamphlet lately issued from the pen of Mr. Brougham. From this we predict, that if the Mechanics' Institution remain much longer under such guidance, it will become a seminary for disaffection and infidelity.

These are the only branches of education which the author seems really to wish disseminated, for on these he bestows the greatest emphasis, and supports them with the childish argument—"What *harm* can they do? A good church and a good constitution can never suffer from investigation."* Thank heaven! our church and our constitu-

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* *From Mr. Brougham's Pamphlet*:—

"One can hardly conceive a greater benefit than those would confer, who would make a judicious selection from our best authors, upon ethics, *politics*, and history, and promote cheap editions of them in numbers"—"Why should not political, as well as other works, be published in a cheap form, and in numbers?" page 4.

"To allow, or rather *to induce*, the people to take part in those discussions, is, therefore, not only *safe*, but wholesome to the community" —"Why, then, may not every topic of politics, *party* as well as general, be treated of in cheap publications?"—"The abuses which through time have crept into the practice of the constitution, the errors committed in its administration, and the improvements which a change of circumstances require, even in its principles, may most fitly be expounded in the same manner."—page 5.

"Nor is there any reason why moral and political philosophy should not be explained in public *lectures*."—page 11.

"Moral and political philosophy may be acceptable, even where there is no field for teachers of chemistry and mechanics."—page 27.

tion will ever rise the higher in the estimation of enlightened minds, the more closely they are investigated. But will the fool and the philosopher reason alike upon the same thing? Will the uneducated mechanic detect the subtle reasonings of the atheist, or the cant of mischief-making disaffected subjects? Yet to these ends it is that the mechanic is to devote his "hour or two every other day,"—this is the *useful* instruction he is to receive. How consistent thus to talk of economising time and money, and in the same breath to point out and recommend a way of wasting both! The mechanic is to devote *every* leisure moment to the study of the principles of his craft, and the remainder is to be employed in learning to become an alien from his God and his king.

This is the *outward* face of the work before us; but the interpretation of the Hibernicism becomes evident on inspection. The philanthropic author wishes no craft to exist but the *craft* of whiggism, and the artizan's savings of time and pence are to be devoted to the acquirement of its *principles.* In good sooth it is a *deep* study; and it was well advised to recommend a lecturer in every manufactory, else few indeed would be found who could dive *low* enough to find these *principles.* This it is which is to rouse (what we must allow to be in a state of most luxuriant cultivation in that quarter) the spirit of invention; this it is which is to make the British artizan to rise superior to all Europe! It is very evident, indeed, that the object of this publication has been to draw partizans to the author's political creed, rather than to promote the education of the people; for in every page almost we find half the type devoted to liberty and independence.* The poor artizan must pay for his learning,

* "But it seems adviseable, that even where gratuitous assistance could be obtained, something like an adequate remuneration should be afford-

lest he lose his liberty by receiving it gratis; he must be lectured on politics, lest he lose his independence. There is such a thing as slavery in religious opinions too, so he must be taught to despise forms, and follow nature and Tom Paine.

How can it be expected, that, under such leaders, the Mechanics' Institute should prosper? (by prosper, we mean have any beneficial effect;—prosper it may, in one sense of the word, but it is not always the good cause which has most followers). This, however, is not the only error the institution has fallen into;—we dislike their principles generally. That spirit which is so sedulously inculcated, of refusing gratuitous instruction, seems to us ill founded and ill judged. It is, say they, to preserve amongst the members that interest in the affairs of the institution which is so indispensable to its well doing. It is true, we grant, that when the poor mechanic *has paid* his contribution, he will naturally feel interested in the return that he is to get for it; but how often will he look at his hard-earned pence, and hesitate, while he balances the cost and the probable advantages, ere he decide upon sacrificing so large a portion of his earnings? We apprehend (without taking into consideration that unquenchable thirst for knowledge, which we are told so powerfully prevails) that the operatives would feel a far kindlier interest, if the tax were reduced to one-fourth of what it is: but if they disdained to slake

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ed, both to preserve the principle of independence among the working classes, and to secure the more accurate and regular discharge of their duty."—page 12.

"I have said that the *independence* of these undertakings, as well as their success, is to be considered. I really should be disposed to view any advantage, in point of knowledge, gained by the body of the people, as somewhat equivocal, or at least as much alloyed with evil, if purchased by the increase of their dependence upon their superiors."—page 16, &c. &c.

their "*ardent thirst*" at so cheap a rate, incentives in the way of *honour* might be offered to feed their dainty palates. Another reason why these poor fellows are to lay down the fiftieth part of their year's gains, to *acquire* a *zest or interest* in receiving instruction (notwithstanding that they thirst so violently for it) is, that the lecturers may be adequately paid, lest they neglect the regular discharge of their duties. But the last and most unanswerable of reasons is the preservation of "the principle of *independence* among the working classes." This is the real reason—the old note vibrates again; but no one will imagine that the mechanics could become one iota more dependent, *when no wish existed to make them so.* We see this wish, however, displayed and acted upon by the *proprietors* of this institution, and the members reduced to the most abject dependence by those who thus affect to declaim so vehemently against it! On similar grounds it is argued, that the management of the affairs should be left entirely in the hands of those for whose immediate benefit such institutions are. Here again we differ; and we are borne out in our opinion by three-fourths of the mechanics' institutions which have lately sprung up in this kingdom.* Considering them, as we do, *schools* for adults, we are at a loss to imagine why the *pupils* should have the direction of their own tuition, or how they should be competent to that direction.

However, were the Mechanics' Institute fully adequate

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* Amongst these we may particularize the Institutions of Leeds, Manchester, and Aberdeen, lately established; and the "School of Arts" of Edinburgh. The first Report of this school says,—"It is conceived that *persons of education* are better able to determine what course of instruction is best fitted to obtain the objects in view, and which are the most suitable books for the library; that *the student should have nothing to do, but to attend to the instruction, as in a school.*

to the accomplishment of its own views, we should still reject it, as inapplicable to those now under consideration; for we are of opinion, that all the wants of the poor mechanic would be most effectually provided for by *one* institution. How to frame this institution, so as to exclude from it that abuse which has been observed to creep into all associations of this nature, is a difficult, but, we trust, not an impossible undertaking.

(To be concluded in our next.)

PATENT LAWS

OF PRUSSIA, AUSTRIA, NETHERLANDS AND SPAIN.

In compliance with the repeated requests of several correspondents, we have applied for, and at length obtained copies of the Laws relative to Patents, granted for invention in the above kingdoms, of which the following are the leading features; those of France being already given in our present volume.

PRUSSIA.—*Enacted November* 14*th*, 1815.

Every Prussian subject is entitled to a grant of a patent for an invention, an improvement, or an importation.

Application for the patent is to be made to the board of Provincial Directors, where the applicant resides; and accompanying the application there must be drawings and a specification, explaining the objects and detail of the invention.

The Directors ORDER the application to be examined by chosen Referees, who are to transmit their report, with all the documents, to the Minister of Finance and

Commerce, who decides on the grant, or the rejection of the application, and if approved, delivers the patent accordingly.

The privileges are granted from six months to fifteen years, and may be obtained for one or more provinces, or for the whole kingdom.

The patentee is bound to publish in the local gazette, within six weeks, the grant of the patent; the neglect of which formality invalidates the privilege.

In order to encourage industry, *no tax or duty* is levied on patents, excepting stamps and enrolling official charges.

Whosoever proves that he made use of the invention or manufacture patented, previous to the date of the grant, is entitled to continue his own manufacture.

The infringement of patent rights are prosecuted before the provincial courts of justice, wherein the offending party resides, and the appeal may from thence be carried before the Minister of Finance and Commerce.

The first infringement is punished with the costs of suit, and the interdiction of manufacturing the patented article. On further infringements, the seizure of the tools and manufactures are ordered, and the patentee may sue for damages.

A patent becomes invalidated and void,

1. If the manufacture has previously been described and published in print.

2. If the patentee has not executed his privilege within a given time.

3. If the patentee has himself obtained, for the same, a patent abroad.

4. If the patented article or manufacture is dangerous to public safety, or contrary to law.

The sums deriving from inrolling charges, &c., are to be employed for the encouragement of industry.

The same act states that all former laws or privileges are from hence revoked.

AUSTRIA.—*Enacted December* 8, 1820.

The application for a patent of invention, improvement, or importation, is be lodged before the provincial board of Directors of the applicant's residence.

A true and faithful specification, with drawings thereof, is required.

The patent dates from the day and the hour of the deposit of tne application.

The provincial Director has ONLY to verify if nothing in the manufacture to be patented, be contrary to law and the public welfare.

Patents are to be granted, on the report of the government's committee of commerce and manufactures, appointed for that purpose.

The patent duty, or taxation, is relative to the duration of the patent claimed, which cannot exceed fifteen years.

5 years' duty is C. florins*	50
For the 6th year,	15
7th is	20
8th is	25
9th is	30
10th is	35
11th is	40
12th is	45
13th is	50
14th is	55
15th and last	60

One half is to be paid at the deposit of the documents, the remainder by yearly instalments according to the extent of the patent.

* A Conv. Florin is about two shillings English money.

In order to promote the patentee's interest a prolongation may be obtained, before the expiration of the first patent, if it has been taken for less than fifteen years.

Transfers of a patent right must be legally enrolled at the office of the committee of commerce and manufactures.

Infringements may be prosecuted before the common courts of justice; they pronounce the seizure of the counterfeit manufacture—a fine—and damages.

NETHERLANDS.—*Enacted January the 15th,* 1817.

Patents are granted for five, ten, and fifteen years.

The tax or duty to be paid is from 150 to 750 florins, according to the duration and the importance of the invention, or importation.

A five or ten years' patent may be prolonged to fifteen years, if there be sufficient cause shewn of the utility of the invention, &c., but it can never exceed the fifteen years.

Inventions that have been patented abroad can only be privileged for the time of the original grant.

The patentee may prosecute counterfeiters before the common courts at law, and obtain the seizure of the manufactured article, or machinery, with costs and damages.

The invalidation of a patent arises,

1. From the manufacture being previously known, described, and published.

2. From the patentee not practising, or manufacturing the same.

3. From the patentee himself having subsequently obtained a patent for the same abroad.

4. From the patented article being dangerous and contrary to law.

The sums deriving from patents are to be employed as recompence and encouragements to arts and manufactures, &c.

SPAIN.—*Enacted by the Cortes, October, 2nd,* 1820

Government does not examine the merits of the article or manufacture to be patented, and if the formalities have been observed, nothing be contrary to law, and to public security, or to morals.

Applications for patents of inventions, improvements, and of importations, are to be made before the chief politic, (Sheriff) of the province wherein the applicant resides, From thence the application, with a specification and drawings, are forwarded to the secretary of state.

At the deposit of the application is to be paid,

1000 Reaux for an invention,
700 Reaux for an improvement,
500 Reaux for an importation,

When the patentee receives the indenture the *like* sums are to be paid as above.

A patentee may retain the secret of his patent by shewing sufficient cause.

The grant of patents to be immediately published in the gazette.

Patents are granted, viz :—For inventions ten years,—For improvements seven years.—For importations five years.—But the legislature may prolongate either to fifteen years, and not exceeding this last term.

The improver cannot manufacture the original invention, nor the inventor the improvement, unless they agree by contract.

The priority appertains to him who has first enrolled the application. Transfers of a patent right are lawful.

In case of infringements, the patentee may enter an action at common law, against the counterfeiter, and obtain the seizure of the manufacture, and damages if the wilful infringement is proved,—and on a second conviction four times the amount.

If the counterfeit be from ignorance of the existence of the patent, the counterfeiter is liable to the costs only.

In case an inventor is apprehensive of injury from the divulging of his discovery, a caveat, the term of which the administrationis to determine. During the caveat, granted gratuitously, no patent is to be issued for the same article or manufacture.

All former laws and privileges are herewith revoked.

This enactment has recently been abolished by the present king of Spain, and no patent laws are now existing there.

Novel Inventions.

Method of Preserving Iron Trunks from Oxydation.

The inventor who is a Naval Officer in the French service, employs a composition of resin and olive oil, well mixed with ground bricks, which he mixes to the consistence of paste. He renders the resin adhesive to the interior of the casks or tanks, by melting it with the olive oil, which the iron absorbs; upon this it easily spreads by the application of heat, the composition to which the bricks give solidity, without destroying its adhesive quality. This coating, when used for the interior of the tank, cannot be dissolved or absorb water, but, on the contrary, is rendered more durable; neither is the composition liable to be

affected by the atmosphere, because there is no decomposition of foreign matter, and when outwardly applied, it preserves the iron from oxidating for a very great length of time. The inventor announces that he has employed this composition for many years upon casks in the French navy; and also on the iron hoops, which do not the least oxidate, after having been treated by it.

Hemlock for Tanning, &c.

The tanning principle is extracted and reduced by the process hereinafter described.

The bark is pealed, seasoned and ground in any of the modes already in use; if used without seasoning it is chopped, and so are the twigs. The substances above mentioned are put into a metallic or other boiler or reservoir, filled by them without much pressure; water is then poured in such boiler or reservoir to fill it to the brim, and which is continued until the water is sufficiently saturated, when it is drawn off, other water put in and boiled until the tanning principle has been wholly extracted.

Steam applied in the like manner, to the above described substances, in the mode now in common use, for boiling vegetables with steam for culinary or other purposes, produces a similar effect.

The saturated liquor is passed through a strainer, and slowly evaporated either in the boiler or in shallow pans of large surfaces, to the consistency required.

The extract is soluble in water either hot or cold, which readily converts it into oaze.

Fluid and Transparent Soap.

Our correspondent at Paris, states an important dis-

covery in chemistry has been made to produce a fluid and transparent soap, possessing superior qualities to any compact soap, for personal and domestic use. It may be preserved many years in bottles or casks, air tight, without losing either its quality or weight. The longer it is kept the more effectual. In washing linen and wearing apparel, it penetrates quicker than any other soap, requiring less in quantity. The prime cost price of manufacturing the fluid soap, is also cheaper than other qualities.

The inventor proposes to take out a patent in England, if he meets with encouragement.

Our correspondent, likewise informs us, that he has made use of it for shaving, and found it both agreeable and economical.

Polytechnic and Scientific Intelligence.

Society of Arts.

Our last notice of the transactions of this society up to April closes at page 268, subsequent to that report the respective committees of the society have been engaged in investigating the merits of the following subjects:—

Committee of Mechanics.

The comparative advantages of differently constructed trussed gardens—Apparatus for preventing the injurious effects of dry grinding—Paddles for propelling—Bell buoys —A new plough—Improved sash windows—Cooking ap-

paratus—Mode of curing smokey chimneys—Support for invalids—Method of scouring the floor of the dock at Dover—Mode of scouring the soil from Bridlington Harbour—Apparatus for carrying soil to vineyards—Improvements in ship-building—Fixing lightning conductors on ship-board—The manufacture of gun barrels and sword blades at Damascus—Steam culinary apparatus—A chamber candlestick—Improved mode of elevating the pipe of a fire-engine—An instrument for cutting an original screw—Several clocks and other time-keepers on improved constructions—Surgical apparatus for various purposes—A mode of supplying steam boilers with water—An expanding wedge—Novel mode of firing guns by means of percussion—Improvements in building and rigging flush-decked ships of war—A flying target—An improved pump—Instruments for relieving certain kinds of lameness—A stomach syringe upon an improved plan—An instrument for correcting contracted joints—An artificial nose—Guards for the eyes of persons breaking stones—Improvements in the construction and erection of stables—Canal locks—Washing machinery—Acorn mill—Improved shoes for horses—A fire escape—Apparatus for heating and cooling worts and other liquors—On magnetism.

Committee of Manufactures.

Specimens of bonnets and hats made of split straw and others; in imitation of Leghorn—Cloth made from New Zealand flax.

Committee of Chemistry.

Improved methods of salting provisions—A miner's safety-lamp—Apparatus to enable persons to breathe in thick smoke, and other suffocating vapour—Novel modes of curing provisions—Oil without glutin for chronometers

—Painted glass—New preparation of Prussian blue—Mode of preserving sole leather—Improved crucibles for casting—Mode of clearing alabaster vases—White paint for water colours—Electro-magnetic apparatus.

Committee of Agriculture.

Improved method of raising rye-grass—Working land—New kind of bee-hive, and management of bees—Planting trees—Raising oaks.

Committee of Colonies and Trade.

Specimens of cloves and cinnamon grown in the colony of Trinidad—Extract of Mimosa bark—A vegetable fibre from the Cape of Good Hope—Cocoa-nut oil—Culture of pepper in the West-Indies.

Committee of Polite Arts.

Mode of printing in colours—An instrument for drawing in perspective—Designs for a church in Doric architecture—Plan for preventing the forgery of bank-notes—Etching ground for engravers—New method of copying drawings on a different scale from the original—Flowers cut out with scissars—Improved system of short-hand writing. Besides these subjects, this committee has considered the claims of the different juvenile arts, for paintings and drawings in the several classes, and reported upon their several merits. The Society having adjudged rewards to the honorary and pecuniary, for such of the subjects presented to them during the present sessions, as they approved, His Royal Highness the Duke of Sessex, then president, attended on Monday the 30th of May, at the King's Theatre, in the Haymarket, and presented the rewards to the successful candidates in the following order:

In Agricultural and Rural Economy.—To Ralph Creyke, jun. Esq. Rawcliffe House, near Thorne, Yorkshire, for warping 429 acres of peat, by an improved method, the large Gold Medal.—To Col. James Wilson, Sneaton Castle, near Whitby, for planting 174 acres with forest trees, the large Gold Medal.—To Messrs. Cowley and Staines, Winslow, Bucks, for raising seed from the American grass used in making fine plat, Twenty Guineas.—To Mr. Wm. Salisbury, Barossa Place, Brompton, for his communication respecting the material employed in Tuscany for fine plat, the Silver Ceres Medal.—To George Whitworth, Esq. Acre House, near Castor, Lincolnshire, for his improved perennial rye grass, the Silver Ceres Medal.

In Chemistry.—To Mr. J. Roberts, St. Helen's, Lancashire, for his apparatus to enable persons to breath in air loaded with smoke and other suffocating vapours, the large Silver Medal and Fifty Guineas.—To Mr. H. Moore, Green Hill, Derby, for his mode of etching and cleansing alabaster, the large Silver Medal.—To Mr. L. Anstey, 27, Drummond Crescent, Somers Town, for his improved melting pots for iron and brass-founders, the Silver Vulcan Medal and Twenty Guineas.—To Mr. W. Sturgeon, 9, Artillery Place, Woolwich, for his improved electro-magnetic apparatus, the large Silver Medal and Thirty Guineas.

In Mechanics.—To Mr. W. Friend, Earl-street, Clifton-street, Finsbury, for a secret lock, Ten Guineas.—To Mr. J. P. Hubbard, 103, Leadenhall-street, for a folding chair, the Silver Vulcan Medal.—To Mr. C. W. Williamson, New-street, Elizabeth-place, Kennington Cross, for an improved smoothing plane, Ten Guineas.—To Mr. T. Griffiths, Royal Institution, for an expanding wedge for sawyers, the Silver Vulcan Medal.—To Mr.

David Matthews, Basinghall-street, for his improved mode of barrowing out soil, the Silver Vulcan Medal.—To Mr Elisha Pechey, Bury St. Edmunds, for his pump for raising water, Five Guineas.—To Mr. T. Cluley, Sheffield, for his lithotomy forceps, the Gold Vulcan Medal —To W. Brockedon, Esq. Caroline-street, Bedford-square, for a mechanical apparatus to assist a weak knee-joint, the large Silver Medal.—To Mr. J. Aitkin, 55, St. John-street, Smithfield, for his improved quarter clock, Twenty Guineas.—To Mr. W. Hardy, Wood-street, Spa Fields, for an instrument to ascertain very small intervals of time, the Gold Vulcan Medal.—To T. Dickinson, Esq. Capt. R.N. Purbrook Heath, near Portsmouth, for his mode of applying percussion powder to the discharge of ships' guns, the Gold Vulcan Medal.—To Mr. J. Crow, Master Boat-builder, Royal Dock Yard, Woolwich, for his improved mode of conveying anchors and cannon by means of a ship's launch, the Gold Vulcan Medal.—To Alfred Ainger, Esq. Everett-street, Brunswick-square, for his centering for arches of wide span, the Gold Vulcan Medal.—To Mr. C. Sockl, 17, Royal-row, Lambeth, for a safe valve for steam-boilers, the large Silver Medal and Ten Guineas.—To Colin Shakespeare, Esq. Postmaster-General, Calcutta, for a portable rope bridge, the Gold Vulcan Medal

In Manufactures.—To Mr. R. Jones, Master of St. George's Workhouse, Little Chelsea, for cloth made of New Zealand flax, the Silver Ceres Medal and Five Guineas.

Rewards given for Bonnets of British Materials in imitation of Leghorn.—Mr. James Cobbin, Bury St. Edmonds, Fourteen Guineas.—Mrs. Syrett, ditto, Ten Pounds.—Mrs. Venn, Hadleigh, Suffolk, Nine Guineas. —Anne Venn, ditto, Three Guineas.—Mr. James Long,

Barham House of Industry, Silver Ceres Medal.—The Children of the School at Adbury, Berks, Five Guineas.—Lucy Hollowell, Banbury, Five Guineas.—Mary Marshall, Bandon, near Cork, Two Guineas.—The Children of the School at Bandon, Three Guineas.—Sophia Dyer, West Meon, near Alton, Two Guineas.—Anne Dyer, ditto, Two Guineas.—Maria Paine, Boxted, near Bury St. Edmonds, Two Guineas.—Mrs. Morrice, Great Brickhill, Bucks, Silver Ceres Medal.—Mrs. Laurey, Exeter, Silver Ceres Medal.

In Colonies and Trade.—To J. Mackay, Esq. Picton, Nova Scotia, for an instrument for uprooting trees, the Gold Ceres Medal.—To Messrs. Petchey and Wood, Van Diemens Land, New South Wales, for making and importing five tons of extract of Mimosa bark for the use of tanners, the Gold Ceres Medal.—To M. Le Cadre, Trinidad, for his plantations of clove trees in the Colony of Trinidad, Fifty Guineas.

IN POLITE ARTS.

HONORARY CLASS.

Copies in Chalk, Pencil, or Indian Ink.—To Miss Cockburn, St. John's Wood, Regent's Park, for a pencil drawing of an historical subject, the large Silver Medal.—To Mr. J. B. Sedgwick, 20, Fleet-street, for a pencil drawing of a landscape, the Silver Isis Medal.—To Mr. T. Wilkinson, 2, James-street, Adelphi, for a pencil drawing of a landscape, the Silver Palette.—To Miss Anne Hoare, 9, Great Cumberland-street, for a chalk drawing of a head, the Silver Isis Medal.—To Miss Sarah Field, Grove Lodge, Lower Tooting, for a chalk drawing of a figure, the Silver Palette.—To Miss Sale, 10, Westminster Bridge Road, for a chalk drawing of a head, the Silver Palette.—To Miss Henrietta Tufnell, Bath, for a pencil drawing of a land-

scape, the Silver Palette.—To Miss Amenaide Millot, 17, Sloane-street, for a chalk drawing of an historical subject, the large Silver Medal.—To Miss Martha Smith, 17, Norfolk-street, Strand, for a chalk drawing of a head, the Silver Palette.—To Miss Louisa Honor Fox, London House, Hackney, for a crayon drawing of figures, the large Silver Medal.—To Mr. J. Bizot, Down-street, Piccadilly, for a chalk drawing of a head, the Silver Palette.—To Mr. F. R. Ridgard, Euston-square, for a chalk drawing of a figure, the Silver Palette.

Drawings from Busts.—To Miss Diana Lawrance, 357, Oxford-street, for a finished drawing in chalk from a bust, the large Silver Medal.—To Miss Harriet Salmon, 86, Piccadilly, for a finished drawing in chalk from a bust, the Silver Isis Medal.

Copies in Water Colours.—To Miss Juliana Selina Guy, 3, Bartlett's-place, Holborn, for a landscape, the large Silver medal.—To Miss Waters, Clapton-square, for a portrait in miniature, the Silver Isis Medal.—To Miss Harriet Howell Morton, 4, Jeffries-square, Camden Town, for a group of flowers, the large Silver Medal.—To Miss Clark, 22, Charter House-square, for a group of flowers, the Silver Isis Medal.—To Miss Ellen Hargrave, Greenwich, for a group of flowers, the Silver Palette.

Original in Water Colours.—To Mrs. Carbonnier, 64, George-street, Portman-square, for a portrait in miniature, the large Silver Medal.—To Miss A. A. Bond, 20, York-place, Kentish Town, for a group of flowers, the large Silver Medal.—To Mr. W. Downer, 4, Brewer-street, Woolwich, for a group of flowers, the Silver Isis Medal.

Copy in Oil.—To Miss Emily Evans, Craven-street, Kentish Town, for a landscape, the Silver Isis Medal.

Original in Oil.—To Mr. J. P. Andrè, jun. 5, York-place, City-road, for a group of flowers, the Silver Isis

Medal.—To Miss Manning, the Priory, near Leatherhead, for a portrait of a lady, the large Silver Medal.—To Miss E. Ainslie, Kentish Town, for a composition in still-life, the Gold Isis Medal.—To Mr. G. Hilditch, 13, Ludgate-street, for a composition of fish from nature, the large Silver Medal.

New Patents Sealed, 1824.

To Augustin Louis Hunout, of Brewer-street, Golden-square, in the county of Middlesex, gentleman, in consequence of a communication made to him by a certain foreigner residing abroad, for certain improvements in artillery musquetry, and other fire-arms—Sealed 23d April —6 months.

To Thomas Alexander Roberts, of Mouford-place, Kennigton Green, in the county of Surrey, gentleman, for his discovery of a method of preserving potatoes and certain other vegetables—23d April—6 months.

To Samuel Rider, of Gower-place, Euston-square, in the county of Middlesex, coach-maker, for his invention of an improvement in carriages, by affixing the pole to the carriage by a new-invented apparatus—28th April—2 months.

To Daniel Dunn, of King's Row, Pentonville, in the parish of St. James, Clerkenwell, in the county of Middlesex, manufacturer of essence of coffee and of spices, for his invention of an improved apparatus for the purpose of beneficially separating the infusion of tea or coffee from its grounds or dregs—30th April—6 months.

To William Davis, engineer, of Leeds, in the county of York, and of the Vale of Charlnford, Gloucestershire, for his invention of certain improvements in machinery, for

reducing or converting wool into slivers or threads of any desired length, unlike worsted, presenting more numerous hair points projecting from the surface of the slivers or threads—7th May—6 months.

To Thomas Hill, the younger, of Ashton-under-Line, in the county of Lancaster, land surveyor and engineer, for his invention of certain improvements in the construction of rail-ways and tram-roads, and in carriages to be used thereon, and on other roads—10th May—6 months.

To Edward Elliss, of Crexton, near Rochester, in the county of Kent, lime merchant, for his invention of an improved brick, or substitute for brick, manufactured from a material hitherto unused for or in the making of bricks—14th May—6 months.

To Samuel Pratt, of New Bond-street, in the county of Middlesex, camp equipage manufacturer, for his invention of an improved manner of combining wood and metal, so as to form rails or rods, adapted to the manufacture of bedsteads, cornices, and other works, where strength and lightness are desirable, which he denominates union or compound rods—14th May—6 months.

To John Charles Christopher Raddatz, of Salisbury-square, Fleet-street, in the City of London, merchant, in consequence of a communication made to him by Ernst Alban, of Rostock, in the Grand Duchy of Mecklenburgh Schwerin, doctor in medicine, for his invention of certain improvements on or connected with steam engines—14th May—6 months.

To Jean Francois Gravier, of Cannon-street, in the City of London, merchant, in consequence of a communication from a certain foreigner residing abroad, for an invention of a certain method or methods of regulating the emission of flame of gas from portable reservoirs, and encreasing the safety or security of such reservoirs—14th May—6 months.

To Thomas Pyke, of Broadway, near Ilminster, in the county of Somerset, dissenting minister, for his invention of a machine or apparatus to prevent the overturning or falling of carriages—14th May—2 months.

To Alexander Galloway, of West-street, in the City of London, engineer, for his invention of a machine or machines, for the forming and moulding of bricks and other bodies, usually made from clay plastic, or any of the usual materials from which building or fire-bricks are commonly made—14th May—6 months.

To William Grimble, of Cow-cross-street, in the county of Middlesex, gentleman, for his invention of certain improvements in the construction of apparatus for distilling spirituous liquors—14th May—6 months.

To Edward Garsed, of Leeds, in the county of York, flax spinner, for his invention of certain improvements in a machine or machinery for hackling, combing, or dressing flax hemp, and other fibrous materials—14th May—6 months.

To Henry Oswald Weatherley, of Queen Ann-street, in the parish of Saint Mary-le-bone, in the county of Middlesex, for his invention of certain apparatus or machinery, for the purpose of splitting, rending asunder, cutting or cleaving of wood, and forming and securing the same in bundles—14th May—6 months.

To Goldsworthy Gurney, of Argyle-street, Hanover-square, in the county of Middlesex, surgeon, for his new-invented apparatus for propelling carriages on common roads or on railways—14th May—6 months.

To John Young, of Wolverhampton, cooper, for his invention of certain improvements in the construction of locks for doors, and other purposes—14 May—6 months.

To James Fox, of Plymouth, in the county of Devon, rectifying distiller, for his invention of an improved safe, to be used in the distillation of ardent spirits—14th May—2 months.

To Charles Macintosh, of Crossbasket, in the county of Lanark, in Scotland, Esq. for his invention of a new process for making steel—14th May—6 months.

To John Badams, of Ashted, near Birmingham, in the county of Warwick, chemist, for having invented, or found out and discovered, a new method of extracting certain metals from their ores, and of purifying certain metals—16th May—6 months.

To Isaac Riviere, of Oxford-street, in the parish of St. George, Hanover-square, in the county of Middlesex, gun-maker, for his invention of an improved construction, arrangement, and simplification of the machinery by which guns, pistols, and other fire-arms are discharged—20th May—6 months.

D.	H.	M.	S.	
1	5	0	0	☾ in conj. with B in Oph.
1	9	17	8	♃'s 2nd. Sat. will emerge
2	21	0	0	☾ in conj. with ο in Sag.
3	0	0	0	☾ in conj. with π in Sag.
3	3	0	0	☾ in conj. with d in Sag.
4	8	0	0	☾ in conj. with β in Cap.
4	10	3	14	♃'s 1st. Sat. will emerge
8	2	17	0	☾ in □ last quarter.
9	0	0	0	♀ Stationary.
11	4	0	0	☾ in conj. with η in Pisces.
13	4	0	0	☾ in conj. with δ in Aries.
14	4	0	0	☾ in conj. with A in Taurus.
14	13	0	0	☾ in conj. with 2 η in Tau.
16	0	0	0	☉ Eclipsed invisible at Greenwich, but will be centrally eclipsed in long. 5° 13½′ W. and in lat. 0° 56½′ N.
16	0	22	0	Ecliptic Conjunction or ● New Moon.
16	15	0	0	☽ in conj. with μ in Gemini.
17	8	0	0	☽ in conj with ζ in Gem.
18	5	0	0	♀ in conj. with ι in Taurus.
19	9	0	0	☽ in conj. with 2α in Cancer.
20	4	0	0	☽ in conj. with ο in Leo.
20	13	0	0	☽ in conj. with π in Leo.
21	6	48	0	☉ enters Cancer.
22	23	15	0	☽ in □ first quarter.
23	5	0	0	☿ in conj. with ♄ long 13° in Gemini ☿ lat 1° 22′ S. ♄ lat. 1° 27′ S. diff. lat. 0° 05′.
24	11	0	0	☽ in conj. with i in Virgo.
24	12	0	0	♄ in conj with ι in Taurus.
27	3	0	0	☽ in conj with δ in Scorpio.
28	13	0	0	☽ in conj. with B in Oph.
29	22	4	0	Ecliptic opposition or ○ full moon.
30	6	0	0	☾ in conj. with ο in Sag.
30	8	0	0	☾ in conj. with π in Sag.
30	12	0	0	☾ in conj. with d in Sag.
30	17	0	0	☾ in conj. with ♅ long. 19° in Capricornus ☾ lat. 2° 29′ N. ♅ lat. 28′ S. diff. lat. 2° 57′.

The waxing moon ☽ — the waning moon ☾

Rotherhithe. J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, April and May, 1825.

1825.	Thermo. Higt.	Thermo. Low.	Barometer +	Barometer −	Rain in inches.	1825.	Thermo. Higt.	Thermo. Low.	Barometer +	Barometer −	Rain in inches.
Apr.						May.					
26	61	42	29,63	29,50	,05	11	64	42	29,94	29,90	1,
27	59	48	—,28	—,20	,625	12	57	48	—,80	—,76	1,75
28	60	38	—,40	—,30	,025	13	52	46	—,97	—,78	,1
29	62	47	—,50	—,40		14	63	38	30,48	30,05	
30	60	43,5	—,66	—,62		15	62	34	—,10	—,00	
May.						16	55	41	—,90	station	
1	59	41	—,62	—,56		17	62	43	—,13	—,00	
2	61	42	—,58	station	1,325	18	62	36	—,18	—,17	
3	60	44	—,80	—,58		19	63	38	—,17	—,16	
4	68	45,5	—,87	—,83		20	67	36	—,15	—,10	
5	68	53	—,80	station	,05	21	69	39	—,10	—,07	
6	72	50	—,78	—,76	,125	22	70	37	—,02	29,98	
7	65	49	—,82	—,70		23	78	45	29,84	—,80	
8	63	50	—,88	—,82		24	65	47	—,75	—,67	
9	70	43	—,98	—,95	,075	25	68	49	—,59	station	,075
10	67	41	—,98	station							

CHARLES H. ADAMS, LOWER EDMONTON.

LITERARY NOTICES.

Danish Literature.—A Dictionary of the Danish Language, publishing under the immediate direction of the Society of Sciences, at Copenhagen, is tardily making its appearance. The commencement of the publication was in the year 1777, and it has now only arrived at the letter *m*. This Dictionary, in which the Danish words are explained, in the same language, is intended principally for the inhabitants of Denmark and Norway. Nevertheless, it cannot fail to excite interest in the philologists of all countries, who are desirous of acquiring a knowledge of northern languages, derived from the most pure and abundant sources. The Danish language is more remarkable for its antiquity than perhaps any other, its ground-work having descended from the era of Odin to the present time, escaping the interpolation arising from foreign conquest. The ancient Danish language prevails over all Scandinavia, and the countries in which this northern people had planted themselves. The written language, or the language of the national songs, was the same in the northern parts of Scotland, in Norway, Sweden, and Denmark.

Africa.—Through the Dumfries Courier, by a letter received from Lieut. Clapperton, who is a native of that place, we understand that the traveller writes under the date of the 25th December, from Mourzouk, "*the River Niger is not lost in any interior marsh or desert, but continues its course to the sea.*"

Dr. Alexander Jamieson is upon the eve of giving to the world, the first part of a new Practical Dictionary of Mechanical Science, which will be illustrated by many hundred Engravings.

Chronometers.—The Prize of £300, assigned by the Lords of the Admiralty for the best Chronometer, after one year's trial at the Royal Observatory of Greenwich, has just been awarded to Mr. R. Widenham, of East-street, Red Lion Square; his Chronometer having only suffered within the year, an extreme variation of one second 84 hundreds of time, according to the table of mean rates, computed by the Astronomer Royal, from actual daily observation. There are in general 30 Chronometers in the Royal Observatory for competition. Mr. Widenham's having varied the least, has been purchased at the prize value by the Lords of the Admiralty.

M. Angelo Mai, is said to have made farther discoveries of literary treasures at Rome, including fragments of some of the lost works of Diodorus and Polybius.

The Rev. Stephen Gilly has in the press one volume octavo, with 2 Maps: a Narrative of an Excursion to the Mountains of Piedmont, and Researches among the Vaudois and Waldenses, Protestant Inhabitants of the Cottian Alps; with an Appendix, containing copies of Ancient Manuscripts, and other interesting documents, in illustration of the History and Manners of that extraordinary People.

Two new *frescos* have just been discovered at Pompeia, which are most remarkable for the perfect correctness of their design, and for the excellence of their colouring. They represent *Briseis taken from Achilles, and the Nuptials of Thetis and Peleus.* These pictures still remain in the place where they have been found, and are considered as the finest that have ever been discovered, belonging to ancient time.

The celebrated vessel Columbus, which brought to England, last year, such an immense cargo of timber, has, on its return to America, foundered on the coast of Newfoundland.

LONDON
SHACKELL AND ARROWSMITH, JOHNSON'S-COURT, FLEET-STREET.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. LV.

Recent Patents.

To Francis Devereux, *of Cheapside, in the City of London, Merchant, for his Invention of certain Improvements on the Mill or Machine for grinding Wheat, and other articles, commonly known by the name of the French Military Mill.*

[Sealed, 8th January, 1824.]

In the several campaigns of the French army under Bonaparte, small portable corn mills formed part of the baggage, and were employed by the soldiers in grinding the corn for their bread upon the march. One of these portable mills was presented by Sir John Sinclair, to the Society of Arts, in the year 1816, and they published in the XXXVth Vol. of their transactions, a particular description of the mill, and the following report:—

"On examination by the committee of mechanics, it appeared to combine, in an eminent degree, the qualities

of portability, of simplicity, and ingenuity of construction, of facility in making use of it, and of expedition in regard to the quantity of work done. The society, adopting the recommendation of the committee, resolved that a description of it should be inserted in their annual volume, in the hope that it might be found useful, not only in an army on active or foreign service, but in work-houses, in prisons, in schools, and in private families."

The report goes on to state, that an ingenious member of the society has manufactured a considerable number of these mills, and that they have found a ready sale and afforded general satisfaction. The latter clause, however, appears to have been rather premature, for these mills, though capable of producing such flour as might supply the exigencies of an army, were perfectly inadequate to the production of a good impalpable meal, and have subsequently been abandoned as inefficient.

The subject of the present patent, therefore, is certain improvements upon the invention first introduced into this country, as above; which improvements are designed to regulate the distance of the cutting plates, according to the required fineness of the meal to be produced.

Plate XVIII. fig. 1, is a vertical section taken through the middle of the mill, and fig. 2, is a horizontal or top view, which together exhibit its internal construction: *a a*, is the outer case, or iron box, in which the mill is enclosed; *b b*, is the central shaft, revolving in circular apertures; in the side of the box, *c c*, is the stationary cutting plate, made of steel, and fixed in a vertical position by screws passed through the iron box, which plate answers to the bed stone in ordinary mills; *d d*, is the rotatory plate, also of steel, attached to the shaft, *b*, and revolving with it, in place of the upper stone in ordinary mills. The corn or other seed is to be introduced into the mill at the

hopper, *e*, from whence it descends by a channel cut through the fixed plate *c*, into the narrow space between that and the revolving plate, *d*; the faces of these steel plates having been cut into grooves similar to ordinary bur stones. The plate, *d*, is made to revolve by turning the winch, or handle, *f*, upon the central shaft, and the corn falling in between the plates, becomes broken and pulverised by the teeth, during the revolution, and ultimately descends from the periphery *f*, of the plates, on the lower hopper, *g*, from whence the flour is received into a box or bag, ready to be bolted.

Upon the accuracy with which the plates, *c*, and *d*, are made and attached, the effective operation of the mill depends, and in order to adapt it to different degrees of fineness, the improved adjusting parts are introduced. The revolving plate, *d*, is affixed to the shaft by a screw box, *h*, which being turned either to the right or left cause the plate, *d*, to approach the plate, *c*, or rescind from it, and hence, to contract or widen the space between the plates, according to the sort of meal to be produced. When this adjustment is to be made, the pall must be raised out of the ratchet wheel, *i*, and the screw box, *h*, turned, the pall must then be let fall again into the ratchet, for the purpose of keeping the plate at its proper distance.

[*Inrolled, July*, 1824.]

To JOHN HEATHCOAT, *of Tiverton, in the County of Devon, Lace Manufacturer, for his Invention of a Machine, for the Manufacture of Platted Substances, composed either of Silk, Cotton, or other Thread or Yarn.*

[Sealed 20th November, 1823.]

THIS invention is a new mode of arranging bobbins in a

frame, and of actuating them, so as to produce a platting of the threads, similar to the Leghorn plat. Such a movement has been before produced, by a different arrangement of bobbins traversing in circular directions, but the present invention of the patentee is to place several series of bobbins, cross-wise, in one machine, and to cause the bobbins of each series respectively, to traverse to and fro along their frame in zig-zag directions.

Plate XVIII. Fig. 3, is an end view of the platting machine, shewing one series of the bobbins, with the spindles and barrels standing in the form of a pan; *a, a,* is an iron plate, curved as the quadrant of a circle; upon this plate the standards are fixed, on which the barrels, *b b,* turn; *c c,* is a second, and *d d,* a third curved plate, parallel to *a a,* both of which plates have circular apertures, for the barrels *b b* to turn in; *e e,* are toothed rims at the lower parts of the barrels, taking into each other, and *f,* is a toothed wheel upon the oblique shaft, *g,* by means of which the train of barrels are all made to revolve, this wheel and its shaft being actuated by bevel gear, connected to the main revolving axle, *h*; *i i,* are the bobbins, each being placed upon a hollow spindle, *j j,* and from these bobbins, the thread or other filaments intended to be platted, extend and meet between the rollers, *k,* at top.

Fig. 4, is a portion of one of the plates *c,* or *d,* upon an enlarged scale, seen on the upper side, by which the mode of driving the bobbins to and fro will be understood; *b b b,* represent the heads of the barrels, (one of which barrels is shewn detached at fig. 5.) The heads of the barrels are made to stand alternately, one over, and the other under the next to it, which contrivance is for the purpose of enabling the notches in the heads of the barrels to receive and lock the spindles. Fig. 6, shews one of the bobbins, *i,* upon its spindle, *j,* detached from the

machine; from the top of these bobbins the threads extend, as shewn in fig. 3, to the rollers, *k*, where the platting is effected. Twenty-one of these bobbins and spindles are proposed to be employed in each series, for producing one piece of plat; they are all independent of each other, their spindles being received by the notches, *x x*, in the heads or enlarged parts of the barrel, and they are held there, as the barrels revolve, by the circular apertures in the plates, *c* and *d*.

In order to produce a platting of the threads, the bobbins must be made to traverse to and fro in a zig-zag direction, crossing each other, so as to lay the threads one over the other in succession. The spindles which carry the bobbin, are shewn in section at *j j j*, fig. 4, lodged in the notches of the barrel heads, *b b b*; supposing the spindle *j* 1, to have been brought by the rotation of the barrel, *b* 1, into the situation seen in the figure, the point of a guide tumbler, *l* 1, which moves upon a pivot, will prevent it from proceeding further with the barrel, *b* 1, and will guide it into the notch of the barrel, *b* 2, with which the spindle will now proceed round, pressing against the side of the guide tumbler, and bringing it into the situation shewn by dots, until coming, as at *j* 2, against the point of the guide tumbler, *l* 2, the spindle will be pushed out of the notch of the barrel, *b* 2, into the corresponding notch of the barrel, *b* 3, and in the same manner, being brought to the situation of *j* 3, the spindle will by the point of the tumbler, *l* 3, be pushed into the notch of the barrel, *b* 4, and so on.

Another set of the spindles are at the same time traversing in an opposite direction, changing from side to side as the former, at the intermediate points of the barrel's revolution. Supposing the spindle, *j* 4, to have been brought by the rotation of the barrel, *b* 4, into the situation of *j* 3, the point of the guide tumbler, *l* 3, as shewn by dots, will now guide

the spindle into the notch of the barrel, *b* 3, from whence it will be carried by the rotation of the barrel into the situation of *j* 2, and here the point of the guide tumbler *l* 2, as shewn by dots, will cause the spindle to pass into the notch of the barrel, *b* 2, by which means it is enabled to proceed to the situation of *j* 1, where the point of the guide tumbler, *l* 1, shewn by dots, will force it into the notch of the barrel, *b* 1, and here it traverses round, and commences its return from the point at which *j* 1 is situated, and proceeds as before described.

In this manner, twenty-one bobbins, constituting one set, are made to conduct threads and other filaments to and fro in a zig-zag direction, so as to produce a platting at the point where the rollers *k* meet, and by means of an endless screw, *m*, upon the shaft *j*, taking into an oblique toothed wheel, upon the axle of one of the rollers, *k*, as the shaft, *g*, revolves, actuating the bobbins, the rollers, *k*, are made by a slow motion to take up the platting as it is produced.

It is essential to the production of accurate platting that the tension of the threads should be kept uniform during the whole operation: the manner in which this is effected will be understood by reference to fig. 6, which shews one of the bobbins, *i*, and its spindle, *j*, detached from the machine. The thread is drawn from the bobbin, *i*, and passed up a tube, *n*, on the side, from the top of which it proceeds downward through the eye of a needle that hangs within the hollow spindle, *j*, and thence through a guide upwards to the rollers, *k*, as in fig. 3. When a sufficient length of thread has been drawn from the bobbin, and which is held in tension by the descent and weight of the needle within the spindle, a small latch, *o*, is let fall into one of the notches at the top of the bobbin, by which means the bobbin is prevented from turning round; but as the thread is taken up by the platting, the needle rises and lifts

the latch, *o*, out of the teeth, which allows the bobbin to turn and deliver a further supply of the thread, from time to time, as the work goes on.

Should it so happen that one of the threads breaks, the needle belonging to its bobbin instantly drops down through the hollow spindle, and coming out at bottom against the side of a rod, *p p*, as the barrel which carries the spindle goes round, forces that rod from its place, and causes the points on which the wires, *q q*, are suspended to be withdrawn from the arms, *r r*; by these means the lever, *s*, that supports the axle of the bevel gear is let down, and the teeth of the bevel wheel, *t*, coming out of the teeth of the wheel, *u*, the rotation of the shaft, *g*, and consequently the action of the machinery immediately ceases, and remains in a quiescent state, until the thread is mended and the lever raised, which puts the wheels again into gear.

It is to be observed that the improvements which constitute the essence of this patent are defined under four heads; first, the distribution of the bobbins, and the conducting barrels into several distinct series, working in rows to and fro in one frame; secondly, in mounting the axle and spindles in curved bearings, so that they tend to one point, and all the bobbins carry the same lengths of thread; thirdly, in reducing the number of guide tumblers, heretofore employed in such machines, by making the heads of the barrels to extend over or under that which is next to it; and fourthly, in the contrivance for stopping the action of the machine when a thread breaks.

[*Inrolled, May*, 1824.]

To Humphrey Austin, *of Alderley Mills, in the County of Gloucester, Manufacturer, for his Invention of certain Improvements on Shearing Machines.*

[Sealed, 22d June, 1824.]

These improvements consist in a new mode of constructing the cutting roller, or rotatory knife of a shearing machine, by affixing two, three, four, or more blades upon the roller in a spiral direction, the blades running in contrary directions round its periphery, and meeting in angles. The object of this construction of the knife is, that the pile may be cut from the face of the cloth in opposite directions, by the same operation, as the cloth advances between the cutter and the ledger blade: that is, with the laying of the wool obliquely by one knife, and against the wool by the other knife. The effect of this cutter is, that the pile is fairly shorn, not ground off the cloth, and a rich face is left without any bare places or ribs.

The angle at which the blades meet or cross each other, may be varied in several cutters adapted to be used in the machine, and these cutters should be changed according to the length of the pile upon the cloth to be shorn. For cropping long wool, and the wrong side of the cloth, it is proposed to employ a cutter with two long blades, set round the cylinder in a bowed form to each other, meeting in angles at the ends of the cylinder; but for finishing the cloth, a cylinder with four blades crossing, or two long blades in one direction, and two short blades in the reverse direction meeting in angles.

The cylinders are proposed to be made of brass, and to have grooves cut in them in winding directions, for the pur-

pose of inserting the backs of the blades which are to be made fast by wedges or in any other suitable way; or the cylinders may be constructed of wood or other material, and are intended to work against fixed ledger blades laying upon solid metal rests, the upper surface of which is to be made soft by padding with woollen cloth, covered with glazed linen or leather.

In the construction of the shearing machine wherein these rollers work, nothing novel is proposed, the invention being simply the disposition of the knives around, or upon the cylinder in the manners above described.

[*Inrolled December*, 1824.]

To THOMAS MARSH, *of Charlotte Street, Portland Place, in the County of Middlesex, Saddler and Harness Maker, for his Invention of an Improvement in the art of Making Saddles.*

[Sealed, 20th May, 1824.]

THE inventor proposes, instead of stuffing the seat of the saddle with wool or other soft material, to employ rows of small wire-worm springs, such as have been commonly used in making elastic braces, bandages, garters, and other elastic articles of dress. These wire springs are to be extended from the front to the back of the saddle, upon the ordinary packing, and secured by sewing their ends to the web or other material which is attached to the saddle tree. When this is done, the usual coating of cloth is to be put over the wire springs, and fastened down upon the covering of the packing below, by stitching in lines at small distances

apart, crosswise of the saddle, by which means the rows of wire will be kept alongside of each other, and prevented from overlaping. The external covering of leather forming the seat, being now placed over the springs, and finished in the usual way, an elastic seat will be produced, much preferable to any kind of packing heretofore employed for that purpose, the springs giving out and returning according to the pressure of the rider.

All the other parts of the saddle may be made as usual, the introduction of the wire worm springs to give elasticity to the seat, constituting the whole of the improvement, and these wire springs may be either of the constructions that draw to tension by expanding or by contracting.

[*Inrolled July,* 1824.]

To THOMAS BEWLEY, *of Mount Rath, in the Queen's County, Ireland, Cotton Manufacturer, for his Invention of certain Improvements in Wheeled Carriages.*

[Sealed 24th January, 1824.]

THESE improvements are intended to be applied to mail coaches, and have four objects; first, such a disposition of the compartments of the carriage, as shall afford the greatest protection from robbers to the guard and to property within; secondly, a new arrangement of the springs, on which the body of the carriage rides; thirdly, the adaptation of projecting pieces at the lower part of the body, for the purpose of preventing it from overturning, in the event of a wheel coming off, or the axletree breaking; and lastly, in the introduction of a novel

kind of bearings, into boxes, for the axle of the wheels to run against.

Plate XIX. fig. 4, represents the improved mail coach, which is intended to run upon three wheels, and to contain four persons within at the hinder part marked *a*, the entrance door being in the back; *b*, is the space designed for two guards, who, in case of attack from robbers, are to fire their pistols through the small circular windows, or to lift up the roof, which rises upon hinges; or standing upon the seats, to fire their blunderbusses from the top, closing themselves in again while they re-load: *c*, is the seat for the driver, as usual, and *d*, seats on the top of the carriage for outside passengers. The mail and other property is to be deposited in the lower part of the carriage, *e e*, the entrance to which is in the floor of the guards' compartment. By thus arranging the different compartments of the carriage, it is presumed that the guards and the property will be perfectly secure from plunderers.

The second part of the invention, viz. the springs, will be best seen in fig. 5, which is a horizontal view of a portion of the frame of the carriage, shewing the double bearings of the wheel in the side rails, and also the novel construction and disposition of the springs; *f f f f*, are long plate springs, extending on each side of the wheel, fastened to blocks in the middle, which rest upon the side rails; the ends of these springs are connected by cross-bars, *g g*, and from these cross-bars bent arms, *h h*, extend, with plates at their extremities, affixed to the under side of the vehicle; upon these arms the body of the carriage rides, and by the connection being in the middle of the cross-arms, the pressure upon both the springs will be equal.

The third object is to prevent the carriage from falling

over on its side, in the event of the wheel coming off, or the axle breaking; this is done by the lower part of the body of the vehicle extending out some distance on each side, as at *i i*, which projection meeting the ground as the carriage falls, prevents it from overturning.

The last improvement proposed, is the introduction of what the patentee calls stone bearings, into the box of the axle; fig. 6, is a section of this box; *k*, is the end of the axle, and *l*, is a piece of agate or other hard stone, resting upon the axle, with a hollow or recess for the axle to turn in: below there is an anti-friction roller, *m*, bearing against the axle, the pivots of which are supported upon spring bearers; this roller turns round in the box, *n*, partly immersed in oil, and as it revolves, carries oil up to the axle, and thereby reduces the friction.

[*Inrolled, July,* 1824.]

To THOMAS TODD, *of Swansea, South Wales, Organ Builder, for his Invention of an Improvement in producing Tone upon Musical Instruments of various descriptions.*

[Sealed 22d November, 1823.]

THIS invention is a peculiarly constructed piece of mechanism, by which tones may be obtained from piano fortes, and other such stringed instruments, of the same character as the tones emitted from a violin: the manner of effecting this object is shewn in Plate XIX. At fig. 1, *a a*, are two rollers, over which a series of filaments are extended of the same kind as the strings of ordinary

violin bows, which filaments form an endless band *b b*, holding a quantity of pulverised resin; *c c*, represents one of the strings of an upright piano forte, or other such stringed instrument, distended over the bridges, and held by tension pins as usual. It may here be observed, the patentee prefers in all cases that wire should be employed instead of catgut for the strings of these improved instruments; *d* is the key vibrating upon its pin, as in ordinary keyed instruments; *e* is an upright stem, fixed in the key, at the top of which a rod, *f*, is attached, (shewn also in a horizontal view at fig. 2.) This rod is passed through an aperture in the frame, and after being bent into an elbow form, is fixed into a swinging piece, *h*, which piece turns upon pivots screwed through the top and bottom of the frame. There are as many of these swinging pieces to the instrument as there are strings, one being connected to each key by the upright stem and bent rod, as shewn in the figures. At the top of each of these swinging pieces there is a vertical roller, *i*, turning upon pivots, and the action of the whole is as follows.

The endless band, *b b*, is made to traverse between the strings, by the rotation of the roller, *a*, and that is actuated by a band leading from a wheel below, which is turned by a treadle and crank; when none of the keys are touched, the band passes without affecting the strings, but on depressing a key, the rod, *f*, moves the swinging piece, *h*, a little on one side, and causes the roller, *i*, to press a portion of the endless band out of the straight line, so as to bring it in contact with the musical string, and as the band passes forward it rubs against the string, producing a tone of the same character as when the bow is drawn over the string of a violin.

In adapting this contrivance to instruments where the

strings are distended in an horizontal direction, the form and disposition of the mechanism must necessarily vary; this will not, however, affect the principles of the invention, which consists in producing tones from stringed musical instruments of the piano forte kind, similar to the tones of the violin, by causing an endless band to rub against the strings severally, and put them in a state of vibration, exactly in the same way as in passing a bow over the strings of the violin.

[*Inrolled May* 1824.]

To John Slater, *of Saddleworth, in the County of York, Clothier, for his Invention of certain Improvements in the Machinery or Apparatus to facilitate or improve the operation of Cutting or Grinding Wool or Cotton from off the surfaces of Woollen Cloths, Kerseymeres, Cotton Cloths, or mixtures of the said substances, and for taking and removing Hair or Fur from Skins.*

[Sealed 22d November, 1823.]

The operation which this machine is intended to effect is commonly called cropping or shearing, and is usually performed by the action of shears, or some substitute for shears, against the surface of the cloth, whereby the pile or ends of the fibres are cut off, and the surface finished smooth and even. The present invention is a mode of grinding off the surface of the cloth submitted to operation by means of a cylinder, the periphery of which is

coated with a cutting or grinding material, such as emery attached by glue.

Plate XIX, fig. 8, is a side view of the machine; *a* is the grinding cylinder coated with emery, or other cutting material; *b* is the roll of cloth, the surface of which is to be shorn; it is carried up over the cylinder or roller, *c*, along the top of the machine, and round under the small roller, *d*, which holds the cloth against the periphery of the grinding cylinder, *a*, and from hence it descends to the card cylinder or roller, *e*. The machine is put in action by turning the winch, *f*, attached to the axle of the large wheel, *g*; from the periphery of this wheel, *g*, a band extends, which passes over the wheel, *h*, and causes it and its axle to revolve with considerable rapidity; upon the same axle there is a bevel toothed wheel, *i*, actuating another bevel toothed wheel at the lower end of the oblique shaft, *j*, and at the upper end of this oblique shaft there is an endless screw taking into a toothed wheel, *k*, fixed to the end of the card cylinder, *e*, before mentioned. By these means the rotation of the large wheel, *g*, causes the cylinder or roller, *e*, to revolve, and by the points of the cords taking hold of the cloth to draw it progressively over the small roller, *d*. Upon the same axle as the wheel, *h*, is the large wheel, *l*, from whence a band or cord extends over a pulley upon the axle of the grinding cylinder, *a*, and by the rotation of the wheel, *l*, the grinding cylinder is driven with great velocity, by which means it is made to cut or grind away the face of the pile as the cloth is drawn past it, the dust and small particles of the pile ground off being collected in the box, *g*. In order to confine the cloth, and keep it smooth while cutting, a bar of steel, *m*, is placed beneath the small roller, *d*, which is intended to act much in the same way as a ledger blade in other

shearing machines; and to give tension to the cloth before it reaches the grinding cylinder, cards are placed round the periphery of the roller or cylinder, *c*, for the purpose of holding it, and a weighted cord is passed over a pulley upon its axis, to retard its revolution, by which means the cloth is held tight.

In order that the cloth shall not adhere to the surface of the cylinder or roller, *e*, a beater is placed upon the axle of the wheel, *n*, and shewn by dots; which wheel being actuated by a cord extending from the wheel, *o*, upon the same axle as *h* and *i*, carries the beater round, and causes it to strike the cloth off the periphery of the card cylinder, *e*, from whence it falls to the floor; *ppp* is a compound lever, in the end of which the oblique shaft, *j*, turns; when the reverse end of this lever is raised the shaft, *j*, rises also, and by lifting the endless screw out of the teeth of the wheel, *k*, stops the revolution of the drawing roller.

There are various regulating parts not shewn in the figure, such as screws to adjust the distance and height of the roller, *d*, from the cutting cylinder, and also for fixing in a suitable way the bar of steel, *m*. The machine may also be worked without the cylinder, *c*, in which case the cloth must be passed between retarding bars, as *s s*; and several other variations of the machine are proposed, in order to enable the grinding cylinder to act upon the cloth, either length-wise or from list to list.

[*Inrolled January*, 1824.]

To HENRY ADCOCK, *of Summer Hill Terrace, in the Parish of Birmingham, and County of Warwick, Gilt Toy Manufacturer, for his Invention of an Improvement in making Waistbands, or Umbilical, Ventrical, Lumbar, and Spinal Bandages, or supporters to be attached to Coats, Waistcoats, Breeches, Pantaloons, and Trousers, to be either permanently fixed, or occasionally attached and supplied.*

[Sealed, 19th February, 1824.]

THIS invention is the adaptation of small wire springs of a helical form to the above garments, for the purpose of obtaining a pressure upon certain parts of the body, which pressure shall be at the same time elastic. The specification, commencing with a description of the mode in which fine wire is produced by drawing the metal through small holes in a steel plate, and proceeds to explain the manner in which such fine wire is wound upon a rod, or spindle, in a lathe or other machine, for the purpose of bringing it into the form of a helical or worm spring. The process of making such wire springs, is, however, so well known, that we need not describe the methods here.

The shape of the intended elastic bandage being determined according to the part of the body which it is designed to fit, its form is cut out of doubled leather, cloth, silk, or other suitable materials, and made sufficiently long to enable it to give out when the springs open. These bandages are then stitched in lines, leaving spaces between the stitching, for the introduction of the lengths of spring wire, the extremities of the springs being made fast to the end bindings, exactly in the same manner as elastic braces and garters are made.

To set out any particular form of bandage appears to be unnecessary, as the patentee claims every form of bandage, made with such helical wire springs, not confining himself "to any particular mode or way of application;" in adapting these to waistbands, he says that he prefers fixing the elastic braces over the hips; he sometimes places them at the back, and draws them tight by lacing, or he makes them to attach to the garment by buttons, so that they could be put on or removed at pleasure. In adapting these elastic supports to the bowels, they are to have silk strings, so as to bind them to the groin, and admit of the wearer walking with ease. The springs may be made of brass, steel, silver, or other wire, taking care that such wire be properly tempered.

[*Inrolled, August,* 1824.]

About twelve years ago a Patent was obtained by Mr. Mills, of Holywell-street, Strand, London, for Elastic Stays for Ladies in a state of pregnancy, which stays were made upon exactly the same principle as that described in the specification above.—EDITOR.

To JOHN HOBBINS, *of Walsall, in the County of Stafford, Ironmonger, for his Invention of Improvements in Gas Apparatus.*

[Sealed 22d June, 1824.]

THESE improvements apply to the retorts for generating gas from coal, and also to the apparatus for purifying or taking up the tar and other gross matters from the gas. The objects of the first are to afford facilities in charging

the retorts with coal, and in discharging the coke after the distillation has been effected: to distribute the coal equally over the bottom of the retort, and thereby keep the temperature of the coal uniform, to avoid the necessity of luting the joints of the retort, and, upon the whole, to diminish the labour of the attendant during the process. The second object is to construct the purifying vessels upon such plans, that the gas, in passing, may act upon the whole of the lime or other purifying material, without the necessity of agitation, by which contrivance the machinery frequently employed for that purpose may be dispensed with.

Plate XX. fig. 1, is the section of a retort placed in its furnace, with two scrapers, *a* and *b*, attached to long rods which pass through the end of the retort; *c*, is an opening at top, covered by a hinged flap, through which the coal is to be introduced to the retort. In commencing the process, the two scrapers, *a* and *b*, are both to be withdrawn to the extreme end of the retort, beyond the opening, *c*, when the fastening being removed from the flap, the coal is introduced; the scraper, *a*, which extends about half-way down the retort, and is formed as shewn at *a**, is then drawn along the retort, and the coal spread by it in an even layer, upon the whole length of the bottom. The coal is here allowed to remain undisturbed a sufficient length of time for the surrounding heat of the furnace to act upon it, and to drive off the gas, which, as it escapes, passes up the tube, *d*, and thus proceeds to the purifyer.

The coal, which is now converted into coke, is removed from the retort, by advancing the scraper, *b*, the form of the scraper being shewn at *b**. As the scraper advances, it pushes the coke before it, which, de-

scending into the receptacle, *e*, at the end of the retort is there drawn off through an aperture, and removed. The scrapers *a*, and *b*, are now to be withdrawn again to the end of the retort, and a fresh charge of coal introduced as before, at the opening, *c*, and spread to a uniform thickness by the advance of the scraper, *a*, when the process of distillation goes on as before.

Fig. 2, shews that end of the retort at which the coal is supplied, and fig. 3, the reverse end, where the coke is discharged. There are ribs or bars extending along the inside of the retorts, and notches in the scrapers to receive those ribs, by which the scrapers are guided as they advance and retire. The rods of the scrapers, which are necessarily of considerable length, are made to unscrew from the scrapers, for the convenience of removing out of the way; and the flaps or other contrivances which close the openings *c*, and *e*, are coated with sheet lead, in order to make air-tight joints instead of luting: those parts being so far distant from the body of the retort, that the heat will not be sufficient to melt the lead. By this mode of constructing the retorts, it is considered that a great saving will be effected in the expense of their wear, as when the body of the retort becomes destroyed by the action of the fire, new retorts may be attached again and again to the same end pieces, which are fastened to the body by flanges and bolts.

The purifying apparatus proposed, is shewn in section at fig. 4, it consists of a circular vessel with a series of concentric partitions, *a a a*, and a series of inverted circular vessels, *b b*, *c c*, *d d*, *e e*, one within the other. Over the lower part of the vessel, *a a*, a quantity of lime or other purifying material is spread, through which the gas is intended to pass from one compartment of the vessel, *a*, to the next compart-

ment; *f* is the pipe or tube through which the gas rises from the retorts, it first occupies the interior of the inverted vessel, *b b*, then by the increased pressure, as the gas continues rising, it insinuates itself among the particles of lime at bottom, which act as a filter; through the lime it now rises into the first compartment of the vessel, *a a*, and passing over the partition, fills the second inverted vessel, *c c*, which rests upon the first. The gas again by its pressure descends through the lime, and rising in the next compartment, fills the third inverted vessel, *d d*, and so on passing through the lime into the several compartments in succession, until it arrives at the outer vessel, *e e*, which is immersed in water for the purpose of forming an air-tight joint. From this vessel the gas descends through the pipe, *g*, in a purified state, and proceeds to the gasometer, this pipe being inserted into an enlargement of the vessel on the side: *h h h*, are openings with metal caps through which the lime and the residuum from the gas may be withdrawn after the operation of purifying has been performed.

Another arrangement of a purifying apparatus is shewn in section, at fig. 5, it consists of several vessels connected together by pipes, in which the gas is made to pass through lime or other purifying material deposited in the several vessels; *a*, is the tube which brings the gas from the retort, the lower end of this tube has a bell mouth immersed in the lime, the gas, as it advances, is compelled therefore to pass through the strata of lime, from which it rises in the first chamber, *b*, and proceed along the tube, *c*, to the second chamber, and so on, proceeding at length through the tube *d*, to the gasometer: *e e e*, are openings with metallic caps, through which the vessels are charged with lime; the height of the lime in the vessels is known by the small circular apertures, which are to be closed by plugs while the operation

is going on; *fff*, are openings at bottom, through which the purifying material and the residuum is to be withdrawn, and *g*, is a bar of iron as a scraper, one of them being placed in each vessel, for the purpose of raking the bottom, and disturbing any part of the deposited materials, which might not otherwise run off freely.

[*Inrolled August*, 1824.]

To THOMAS FOSTER GIMSON, *of Tiverton, in the County of Devon, Gentleman, in consequence of a communication made to him by a certain person residing abroad, and of discoveries made by himself, for an Invention of various Improvements in and additions to Machinery now in use for Doubling and Twisting Cotton, Silk and other fibrous substances.*

[Sealed 6th November, 1823.]

THE object of this improved machinery is to perform the two operations of doubling and twisting at the same time, and in the same machine, by placing two series of bobbins, carrying the fine threads or unspun filaments of cotton or silk, upon oblique spindles on each side of the machine, above the ordinary verticle spindles: the whole of which are actuated by the main drum; and as the spindles go round the filaments or threads of the material operated upon, become doubled and twisted.

Plate XX. fig. 6. is an end view of a doubling and twisting machine, with the proposed improvements attached. In this figure, the end wheels and other gear,

are omitted for the purpose of shewing the operative parts unincumbered; *a*, is the main shaft, actuated as usual by a rigger and band leading from a steam engine, water wheel, or other moving power; upon this shaft is the drum, *b*, from whence cords pass to the whirls or pulleys of the spindles; *c c*, are the vertical shafts which support the copping rails, carrying the ordinary bobbins and flyers; the lower ends of these shafts rest upon the arms or bent levers, *d d*, and they are made to ascend and descend by the rotation of the heart wheel, *e*, running against rollers at the ends of the levers; this part of the operation is for the purpose of laying the coils of the doubled and twisted threads evenly one beside the other, and is the same as in ordinary spinning machinery.

At the top part of the machine, the oblique spindles, *f f*, are placed, turning in bearings in the frame, *g g*. These spindles carry the bobbins and flyers, *h h*, upon which bobbins are wound the filaments of cotton or silk about to be doubled and twisted, and they are turned by cords from the main drum, passing over the whirls or pulleys, and round the small roller, *i*. The fine filaments or threads of cotton, silk, &c. about to be doubled and twisted, are led from the bobbins over rods to the small rollers, *k k*, where they unite and as the spindles rapidly revolve, the threads become twisted and are taken up and laid evenly upon the copts, *l l*, by the rotation of the flyers, as in other spinning, twisting, and doubling machines.

[*Inrolled May*, 1824.]

To CHARLES CHUBB, *of Portsea, in the county of Southampton, Ironmonger, for his Invention of Improvements in the Construction of Locks.*

[Sealed 15th June, 1824.]

IN the year 1818, a patent was obtained by Jeremiah Chubb, of Portsea, for the invention of a lock, which is now generally known as Chubb's detector lock; the present invention is an improvement upon the said lock, the intention of which, will be best understood by first describing the lock as it was originally constructed, and then explaining the present addition.

Plate XX. fig. 9, is the lock with the front plate removed for the purpose of exhibiting its internal parts; *a*, is the bolt; *b*, several tumblers, one behind the other, moving upon a pivot, the central parts of which are perforated and cut into notches and long slots, for the purpose of allowing studs, *c c*, upon the bolt to pass through when the bolt is projected. The end of the key is made with several steps or indentations, for the purpose of raising the several tumblers to different elevations, at which points of elevation the notches and slots are all brought into coincidence, for the purpose of allowing the studs, *c*, to pass along the slots when the key shoots the bolt backward or forward.

By this construction and adaptation of the tumblers, a very small inaccuracy in the steps at the end of the key would cause the tumblers to be lifted into such positions as would not bring their notches and slots into perfect coincidence; consequently the bolt, under such circumstances, could not be projected either way, and hence, the difficulty of making a false key capable of

opening the lock, or of lifting all the tumblers by any other means into coincidence.

In order to discover whether any such attempt has been made to open the lock, a lever, *d*, is introduced, which is called a detector. One end of this detector lever rests upon the top of the tumblers, and the other end has a tooth, *e*, standing over a notch in the bolt; if in attempting to open the lock, any one of the tumblers should be raised above the proper elevation, the detector lever would be raised also, and the tooth, *e*, at the reverse end falling into the notch, would effectually prevent the bolt from moving either backwards or forwards, the inclined plane at the top of the spring, *f*, locking the detector fast; from which situation it could not be released without taking off the face plate of the lock.

To remedy this inconvenience the present improvement is introduced, which consists of an auxiliary bolt, *g* g, sliding upon the face of the bolt, *a*. When it has happened that by the introduction of a false key the tumblers have been improperly raised, and the bolt has become locked by the tooth of the detector, so as to prevent even its own proper key from opening the lock, the key is to be turned the reverse way, which coming against a small projection, *h*, on the lower side of the auxiliary bolt, drives that bolt a short distance forward, when a small inclined plane, *i*, on the top side of the auxiliary bolt pressing against the under side of the tooth, *e*, lifts it out of the notch, raises the detector lever, and sets the bolt at liberty.

This is the present improvement, and it applies to all locks constructed on Jeremiah Chubb's principle, whether door lock, drawer lock, padlock, or locks of any other description.

[*Inrolled August*, 1824.]

To JACOB PERKINS, *of Fleet-street, in the city of London, Engineer, for his Invention of an improved Method of throwing Shells and other projectiles.*

[Sealed, 15th May, 1824.]

THIS invention arises out of the patentee's numerous experiments on steam: it consists in confining a quantity of water in a wrought iron vessel formed as a rocket, and of heating this vessel containing the water, until a metallic plug in the hinder part, which confines the water, becomes melted: when the great force of the heated water drives the plug from its position, and allows the water to escape in the form of steam, at a very high pressure, which steam (we presume) by striking against the air is to propel the rocket forward.

Plate XX. fig. 7, shews a section of the rocket or hollow vessel, (made of wrought iron), which is to contain the water ; a piece of iron, *b*, is screwed into the end of this vessel, having a small aperture or bore extending through it ; to this piece the tail part of the rocket, with the guide rods, $c\ c_1$ in place of the usual rocket stick, is attached, and the vessel being completely filled with water to a short distance up the aperture or bore, a plug of brass is to be driven into the bore, which confines the water within under considerable pressure.

The rocket is now to be placed in a furnace, the construction of which is shewn at fig. 8. A cylinder, *d d*, made of cast iron, and open at both ends, is to be built into the furnace in an oblique direction, for the purpose of receiving the rocket—which cylinder becoming red hot, will communicate its heat to the rocket placed therein, and when the heat has caused the brass plug (which

closes the bore of this pipe, *b*) to melt, the force from within will drive it out, and the water also, which immediately flashing into steam, will cause the rocket to be propelled forward in the direction of the cylinder, *d d*, which is its guide. The plug may be made of other metals instead of brass, or of such alloys as will melt at given temperatures; the object of this is, that the force of the steam, by which the rocket is propelled, may be under controul, and capable of regulation, by the employment of metallic tubes of different degrees of fusibility.

The patentee states that, this invention is applicable to the discharge of a great variety of projectiles, but that as the principle would be the same in all, he has thought it sufficient to describe the mode of adapting it to the discharge of rockets; adding that "any kind of projectiles, thrown, or propelled, by means of heated water, inclosed in a chamber or bore of the said projectile, and kept under pressure by means of a fusible or other plug composed of such metal, or other material according to the propelling force required, as will cause it to melt or soften, or otherwise yield to pressure, exactly when the water has acquired the necessary temperature, and the melting or ejection of which plug allows the water to flash into steam at that temperature," &c. &c., he claims as his invention.

[*Inrolled, November*, 1824.]

Original Communications.

On the Necessity and the Means of protecting Needy Genius.

(Continued from Page 319.)

To the Editor of the London Journal of Arts, &c.

SIR,

THE first and most difficult point for consideration, is the means of obtaining the requisite funds; they must, of necessity, be great, and will be *immediately* required: for we deem it highly essential that the society should acquire *at once* that dignity and importance to which it is designed and deserves to rise; and that it should be in full possession of resources adequate to the complete attainment of its objects; for thus alone can we ensure its establishment upon that firm basis which will determine its ultimate utility. Unless at its birth it stands forth, Minerva like, in full grown strength and vigour, and vested with powerful and evident claims upon universal consideration and patronage, we cannot with reason expect that it should readily overcome those difficulties which must obstruct it; and but few would be found who would firmly adhere to it, and patiently foster it, while it thus *struggled* into utility. There appears but three practicable modes of raising these funds: viz. 1st. By a Loan bearing interest. 2nd. By transferable shares, entitled to a division of the profits of the institution, thus constituting it a Joint Stock Association. 3rd. By transferable shares, which should constitute the holders thereof proprietors of the institution, and entitle them to certain privileges:—and these are all in some

degree objectionable. The first would render the association most independent; but at the same time the interest of the capital required, (three-fourths of which would probably be sunk in the buildings, &c. appropriate to its views,) would oblige the institution to seek some means of emolument, beyond what it must otherwise have to meet the annual expenditure, which would be a great drawback upon its liberality, and very much cramp its efforts in favour of those for whose benefit it is intended. The second is open to the same objections: there would still be an obligation to enact large profits for its labours, which of all things is the most carefully to be avoided. It is obvious, however, that in very many instances, the party receiving aid from the Society, must repay what has been advanced for him with an interest upon that advance:—for instance, where the Society has obtained a patent for an applicant, they must receive the profit of it until the cost shall have been defrayed, and the Society rather more than reimbursed: but at the same time, this cost should be rendered as light as possible, consistently with the interests of the institution, for the support of which the income so derived will be required.

The third method would be by far the most advantageous to the Society, as a permanent capital would at once be acquired, and unfettered in its application: but by constituting the share-holders *proprietors*, the free agency of the Society is in a great measure compromised, and a door is opened to that innovation which it is our object so cautiously to guard against. It is, however, the most eligible means; and as we hope to find amongst the friends of science, those who will not refuse to contribute upon such terms, we will suppose the funds to have been acquired in this manner, and proceed to explain the requisites of the

Society, striving, at the same time, at some means of neutralizing the objections we have raised.

We have before stated the intentions of the Society:—for the accomplishment of these will be required,

1. A committee of investigation to examine schemes and inventions submitted for reward, or for the protection of patent right.

2. A work-shop and laboratory well supplied with tools and apparatus, where, under certain regulations, the members or applicants may prosecute experiments, &c.

3. An extensive museum of machines and models.

4. A library of reference, exclusively scientific, and reading-rooms supplied with all periodicals upon the arts and sciences.

5. Lectures upon natural and experimental philosophy, practical mechanics, chemistry, and the arts.

6. Elementary schools for teaching the principles of the arts and sciences, as connected with the various crafts.

As it is evident that the committee of investigation must consist of men well skilled in the subjects thus offered for their examination, means must be provided for securing a sufficient number of such men to the institution. The method we have assumed of raising the funds, seems to preclude the possibility of electing the whole quota from among the proprietors; as we must, in that case, determine that a large proportion of the shares should be held by men of science, which would militate greatly against the first distribution of the shares, and their subsequent transfer when requisite. It would therefore be advisable that a part only of such committee should be elected from the proprietors, and the remainder from persons *not connected* with the institution: that is, that the society should solicit persons of well-known ability to accept it as an honorary office. By

this means we should be in a great degree assured against the exercise of any undue partiality by the committee; (which would be more essentially detrimental in this branch of the Society;) and should collect a body of talent which could not by any other means be obtained. Inventions, after being submitted to and reported upon, by this committee, should be laid before a board of directors or council, who would have full liberty to consider, and reject or confirm the report, and to adjudge the award to be conferred. This council should be numerous, and be elected, either the whole or in part, annually; the latter would perhaps be more preferable,—that is, one-half to be continued for the succeeding year, and the other newly elected.

Of the committees of investigation, that portion which consists of proprietors, should be re-elected annually, (or oftener might be advisable) and that which we have called *honorary*, ad libitum, by the ballot of the proprietors. The meetings of the committees should be frequent, (once or twice a week,) for the examination of matters proposed for the patronage of the society; and proprietors ought not to be allowed to resist their election to the office, nor to neglect attendance at every other one, at least, of the meetings, without a sufficient reason being shewn, such as sickness and the like; or incurring a heavy fine: but care should be taken, by a general notice being given some time previous to the election of the party proposed, that no insufficient persons be elected to such committees. The sittings of the council might be monthly, or as often as occasion required, to take into consideration, and to decide upon the proceedings of the committees.

The laboratory and workshops are perhaps the most powerful aid we could offer to needy genius; and where he ought, therefore, to meet with every possible assistance in the way of tools and *workmen:* when inventions have been

approved by the council, the inventor is here to be provided with the means of perfecting models for the society: and when crude schemes have been proposed, and are thought worth prosecuting, it is here that the projector is to be supplied with every facility for the requisite experiments, under the guidance and assistance of persons capable of affording both. The workmen whom we have here spoken of as connected with the workshops, are highly essential: they should be selected from the mechanics who attend lectures and schools, according to the proficiency they have here attained; thus rendering it a part both of *honour* and of *emolument* to them. This would prove a great stimulus to their exertions, and create in them a most beneficial spirit of emulation, as well as a *permanent feeling of interest* in the welfare of the society. They might also be eligible to many other offices in the institution under similar regulations. Their attendance need not exceed a few hours daily, and, when their time was not otherwise employed, they could be engaged in forming models for the museum; so that, while they derived considerable benefit, the society would be amply repaid for what is expended upon them.

We have said that the library should be exclusively scientific,—this we mean at the first rise of the institution; as that is confined strictly to matter of science, and more particularly to mechanics and chemistry, we think it would be but a prudent economy so to confine the library also, at the commencement; hereafter, when the funds may have improved, and the society is capable of extending its views, it may be well to make it more general. The proprietors would, of course, have the use of it; and also the upper classes of the schools. Of the lectures we need say nothing, farther than that they should be frequent, copiously illustrated by experiments, and immediately connected with the practical arts.

The elementary schools are an important feature in the plan of our society; and to render them effective, we would have them limited to the instruction of the mechanics in the arts they practice; and, as we contemplate only such crafts as are immediately connected with the mechanic arts, we do not apprehend that any difficulty would be found in carrying them into effect.* By adopting a system of mutual in-

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* The report of the Edinburgh School of Arts, says:—"The experience of the first year, and particularly the fact that the students were of no less than 48 different trades, convinced the directors that the best plan was to limit the lectures to the general principles of those sciences which are of universal application to the arts, and not attempt as had at first been intended, teaching the principles of the arts in detail." At the time of this report, there were 452 members and the 48 trades were as follows, viz: 111 *cabinet makers and joiners;* 38 *smiths and iron machine makers;* 15 *millwrights;* 27 masons and marble cutters; 11 *watch and clock makers;* 7 *Opticians;* 19 jewellers and silver smiths; 12 tin-men and pewterers; 12 *brass founders;* 5 *die cutters;* 9 plumbers; 7 painters; 6 *dyers;* 10 *printers;* 7 *bookbinders;* 12 *weavers;* 8 shoe-makers; 5 *lapidaries;* 5 *engravers;* 4 *brewers;* 3 millers; 1 baker; 3 iron-founders; 9 turners; 3 glaziers; 9 upholders; 17 farriers; 3 saddlers; 3 *tanners;* 5 taylors; 5 gun-makers; 4 gardeners; 2 musical instrument makers; 3 grocers; 2 spirit dealers; 2 tobacconists; 3 *surveyors;* 1 fishing-rod maker; 1 last-maker; 2 glass-blowers and cutters; 1 modeller and plasterer; 1 hatter; 1 *distiller;* 1 perfumer; 1 tidewaiter; 1 cutler; 27 merchants' clerks; 5 pupils of the Blind Asylum, and 9 no trade entered.

It is evident that the greater portion of this list must have sought this instruction, without any view to its practical application; and for them general lectures would be sufficient. Those who would require to learn the details of their crafts are but few, (we have marked them in italics,) and to them we feel confident, that it might with facility be afforded.

struction, and a careful economy in books and apparatus, they might be conducted with little trouble to the superintendents, and at a very moderate expence. Although it is absolutely necessary, for the good of the institution, that mechanics should pay *something* towards their instruction, yet, to place that instruction within the reach of all, it is equally necessary that the charge should be as low as possible,—not exceeding five or ten shillings per annum, for the lectures and the schools. This is quite as much as the generality of the working classes can afford, or will be *willing* to spare for a *continuance:* the novelty might induce them to give more at first, but when this had gone by they would begin to feel it too serious a tax.

It is of paramount importance that the greatest possible encouragement should be held out to the students: and accordingly they should be eligible to the highest offices of the institution, upon attaining a proper competency to them; and numerous honorary, as well as lucrative degrees and premiums should be established. A great help to this end would be the establishment of a weekly paper amongst them, which should report the lectures of the week, (thereby impressing them the more firmly upon the minds of those who had attended them), and be open to the communications of the members of the schools, with the remarks and replies of the editors. The editors might be selected from the higher classes of the schools; and the work left in their own conduct, with the exception of its being submitted to higher authority for revision, lest any erroneous principles should be set forth in it. The intention of a little work of this kind, is to place within their reach a fund of information, which lies buried to all but the wealthy, in expensive works, or which is treated of in a manner too abstruse for unscienced comprehension:—to afford them a means of communicating their own thoughts, and of viewing the ideas

of their brethren;—and, by inviting discussion, to lead them insensibly to think, to reason, and to a desire of knowledge. By inviting discussion, we do not intend that its pages should be open to all the opinions which speculative ignorance is wont to broach, and the controversies consequent therefrom. This is not *beneficial* discussion: neither is it of any advantage to give admission, indiscriminately, to all the communications by which such a work will probably be assailed; although this is the plan (and it has been commended for that reason) of the majority of cheap publications now in circulation, intended *expressly*, it is said, for the above purposes. The editor of such a work should be capable and willing to pass an opinion upon the communications made to him; and where there is error *he* should carefully explain to his correspondents where they have erred: for it can be of no earthly service to allow several persons to vent their opposite conjectures upon subjects of which they are all equally ignorant.

A simple reference, to a simple and known principle, will most frequently explain away all error, and give information to all parties; whilst these needless speculations do but waste time and paper to no useful end. This work should be distributed, at a small charge, amongst the members; and possibly its circulation might be extended beyond the society, when it would become a means of some small emolument to its treasury. It should be printed by the society; for it would be advisable and requisite, for many reasons, to establish printing in all its branches. It behoves us now to speak of the sources whence the annual revenue is to be derived.—We have,

1. The interest of the funded capital, if any be thus bestowed, which we would recommend.

2. The profits from the patents obtained and held by the society.

3. The subscription to the lectures and schools by the mechanics.

4. The fees to the laboratory and workshop.

5. The profits of the weekly paper.

6. As it would be advisable to admit of annual subscribers to the library and lectures, there would be the amount of such subscriptions.

In addition to these the printing department might be made a means of considerable profit, if the society were to undertake to print (and it might edite also) works of certain descriptions. It is scarcely possible to estimate the probable amount of these various sources of revenue; but we would suppose, that, although small at first, when the society had risen to any consequence and useful operation, they would be considerable, and quite adequate to the proposed purposes of their application. The capital required would not, perhaps, exceed £100,000.; which might be divided into a thousand or more shares: and surely, we may venture to expect that there are as many individuals in this metropolis, who would willingly come forward to support such a national and so truly valuable and necessary an institution. We have said but little of the internal management of the society; but we have laid down broad principles for its general conduct, which if acted upon in their real spirit, we think will prove a firm basis for its foundation. The remainder is the province of the "Bye Laws;" and we will only generally remark, that they should tend as far as possible to promote a cordial union between the mechanics and the upper members; give every encouragement to the former, and at the same time guard against all innovation upon either, as cautiously as though they were framed for the government of a state. Indeed a society of this kind should closely resemble a little state, composed of every grade of knowledge, from the deepest mathematician, to the mere

practical workman—and no less care should be bestowed upon its construction: for as it is easier to prevent the existence of evil, than to correct its consequences—to secure the body against disease, than to eradicate it when established; so to fix at the outset a permament security against all abuse is infinitely more prudent, than to seek the means of *comptrolling* (to *destroy* is impossible) the hydra-headed monster when once he has appeared.

The principal officers of the institution would be, as usual, president, vice-presidents, &c.; and we would strongly advise, to give it that consequence in the eyes of the world, which may enable it to grow at once into merited splendour and estimation, that it should be incorporated by charter, and under royal patronage.

We will not now enter into any further detail, as our more immediate object has been to rouse the public attention, and to enliven their feelings, to the first and most important portion of our paper—"The Necessity of protecting needy Genius."—If we are so fortunate as to attain that end, (and for the honour of our country we sincerely hope it), we shall be happy and proud again to enter upon this most interesting theme, and to strain to the utmost all our feeble means of supporting it; and it is our ardent wish and most fervent prayer that it may find real and kind friends among those whose experience and means the best adapt them to promote the well being of so benevolent an undertaking; and to their generous and sympathizing hearts we leave it; confident that barely to tell of misery is to ensure their kindly aid, and therefore, that we shall not have again to become the unworthy advocates for the Protection of Needy Genius.

French Patents

GRANTED IN 1824.

Perpetual Plaster Kiln. C. J. Accary, Paris, department of the Seine, and A. Jourdan, Gauger, department of Herault, 30 June, for ten years.

Power Loom. Arnaud and Fournier, Paris, department of the Seine, 8 July, for five years.

Apparatus for Manufacturing Turpentine Essence. G. Badeigts de la Borde, Saubusse, department of Laudes, Caveat for ten years.

A Powder as Substitute for Coffee. A. Bailliart, St. Omer, department of Par de Calais, 10 June, for five years.

Hats of Wood, "antifeutre." J. C. Bard, and J. B. Bernard, Paris, department of the Seine, 8 July, for ten years.

Power Loom, (Glasgow.) G. Bardel, Paris, department of the Seine, 10 June, for ten years.

Machine to Manufacture Combs. J. C. Barnet, Paris, department of the Seine, 17 December, for fifteen years.

Improvements in Dervine's Distillery. L. Baron, Nismes, department of Gard, 2 December, for five years.

Articulated Pattens. Baucher, La Chapelle Mer, Paris, department of the Seine, 10 November, for five years.

An Achromatic Glass. C. T. Bautain, Paris, department of the Seine, 19 May, for five years.

Apparatus to Clarify Sugar. F. P. Bayvet, and A. Payen, Paris, department of the Seine, 7 October, for fifteen years.

Cloathing Machine. Beauduin-Kamenne, Sedan, department of Ardennes, 8 January, for five years.

A Flour Mill. J. B. Benoist, J. H. Promeyrat, and J. L. Mercier, Paris, department of the Seine, 8 April, for five years.

Wooden Hats, (see Bard.) V. B. Bernard, Paris, department of the Seine, 8 April, for ten years.

Silk Spinning Machine. Blauchon, Chomeras, department of Ardèche, 8 July, for ten years.

Cyphon to draw off Wines. J. A. Borgiteau, and M. J. Davin, Poctiers, department of Vienne, 23 September, for ten years.

Improvements to Power Looms for Twills. Boucher, neveu, A. Coiffir, Paris, department of the Seine, 15 May, for five years.

Distilling Apparatus. Boucher-Viols, Montpellier, department of Herault, 15 July, for ten years.

A Machine to sow Cloughs, (Cloves.) Boudard, fils amèx, Chaumont, department of Haute Marne, 23 September, for ten years.

New process to manufacture Bricks. Bounin, fils, Aoquevaire, B. du Rhône, 9 September, for five years.

New system of dragging Vessels. Bourdon, frères, Macou, department of Saone and Loire, 20 November, for fifteen years.

An artificial Tippler for Children. Madame Breton, Paris, department of the Seine, 30 June, for five years.

A Process to manufacture Paper with Straw. G. Bronzac, Paris, department of the Seine, 30 December, for fifteen years.

An Air Pump, to elevate Water by compression. S. Brown, Paris, department of the Seine, 30 June, for fifteen years.

Process for Manufacturing a Stuff imitating Lace. Brunier, frères, Lyon, department of the Rhône, 22 April, for five years.

Process for the application of Minerals. Cabany, jeune, Paris, department of the Seine, 12 August, for fifteen years.

Apparatus to extract Tanning Liquor. J. G. Caccia, Paris, department of the Seine, 8 April, for ten years.

Apparatus to teach Astronomy. Cadet de Metz, Paris, department of the Seine, 6 August, for five years.

Improvements on Looms, a la "Jacquart." Calas and Dolempnès, Lyon, department of the Rhône, 6 August, for five years.

A Furniture to receive wet Umbrellas. F. E. Calla, Paris, department of the Seine, 23 December, for five years.

New system of Dressing and Weaving. Leperq Carpentier, Lille, department of Nord, 15 May, for five years.

New Coffee Boiler, to preserve the aromat. A. Caseneuve, Paris, department of the Seine, 29 April, for five years.

"Porphyrisateur," to Pulverise all Substances. L. G. Collier, Paris, department of the Seine, 23 September, for five years.

Apparatus to Manufacture Scales. J. B. Chauy, Lamouville, department of Ardennes, 2 September, for ten years.

Improvement on "Vivien's" Lightening System. Charlet, aîné, Paris, department of the Seine, 21 October, for five years.

New apparatus for Drawing Silk. L. M. Chambon, Alois, department of Gard, 1 July, for ten years.

Fulling, Milling, and Cleaning Cloth. M. A. Chardron, Autrecourt, department of Ardaines, 9 September, for fifteen years.

High Pressure Gas Engine. B. Chaussenor, Paris, department of the Seine, 7 October, for fifteen years.

Process to extract Bituminous Matter. Chervau, frères, Courtenoy, department of Côte-D'Or, 10 November, for five years.

A Doubling Machine. J. Collier, Paris, department of the Seine, 10 June, for ten years.

Process to regulate Spindles of Spinning Machines. J. Corbett, Paris, department of the Seine, 30 June, for fifteen years.

Machine to Cut Dye-wood. Coutagne, ainè, Vienne, department of Isere, 1 July, for ten years.

New Process to distill "Cologne Water." Madame Veuve Crozet, Paris, department of the Seine, 15 May, for five years.

A Warping Machine for Silk. A. Culhat, Lyon, department of the Rhône, 18 March, for five years.

A new method of Cutting Coats. G. H. Dartman, Paris, department of the Seine, 20 November, for five years.

A Power Loom. L. N. Debergue, Paris, department of the Seine, 17 June, for fifteen years.

Improvements on Elastic Beds. A. Delangle, Paris, department of the Seine, 7 October, for five years.

Perpetual Paper Manufacture. E. Delcambre, Paris, department of the Seine, 31 January, for ten years.

Ditto, for Pasteboard of all Sizes, &c. Lememe, Paris, department of the Seine, 12 February, for fifteen years.

Articulated Pattens or Socks. F. H. Devaux, Paris, department of the Seine, 31 March, for five years.

Accelerated Typographic Press. Didoch, père et fils. Paris, department of the Seine, 2 September, for fifteen years.

Rotative Steam Engine. J. C. Dietz, Paris, department of the Seine, 8 April, for five years.

A new system of Spinning Combed Wool. A. M. Debo, Belleville-près-Paris, department of the Seine, 3 November, for fifteen years.

A system of Rotative Oars for Navigation. Ed. Dollman, Paris, department of the Seine, 20 November, for fifteen years.

A doubling Machine for Flax Thread. Doniol, père et fils. Guingamp, department of Côtes-du-Nord, 30 June, for ten years.

A Reeling and Warping Mill. P. C. Duperrier, Louviers, department of Leure, 28 October, for ten years.

New Razor Strops. G. Dupery, Paris, department of the Seine, 12 August, for five years.

Angle Shovels with several points. Q. Durand, Paris, department of the Seine, 10 June, for five years.

Improved Tinning of Metal. Madame Dutillet, Paris, department of the Seine, 3 January, for fifteen years.

An improved Spinning Machine. J. Eaton, Paris, department of the Seine, 22 April, for fifteen years.

A new moving Power. P. Fauches, ainè, Alair, department of Gard, 31 March, for five years.

Process to clear Silk without soap. J. P. Fauquier, Nismes, department of Gard, 8 April, for ten years.

Apparatus for refining Sulphur. Feissat, ainé, Marseille, department B. du Rhône, 22 January, for ten years.

Formation of a Lever, a Substitute for Steam. P. Ferraud, Tourruan, department of S. and Marne, 9 December, for ten years.

New Boiler for Steam Engine. John Fisher, and J. Horton, Paris, department of the Seine, 6 August, for five years.

Process to Tan Leather by compression. Samuel Fletcher, Paris, department of the Seine, 11 March, for fifteen years.

Machine to Manufacture Screws. Jean Fontaine, Paris, department of the Seine, 22 January, for ten years.

Painting on Metal. J. V. Fougères, Paris, department of the Seine, 31 March, for five years.

Bandages for Ruptures. Fournier de Lempdes, Clermont-Ferraud, department Puy-de-Dome, 1 July, for five years.

New Steam Generator. John Fowler, Paris, department of the Seine, 12 February, for fifteen years.

Typographic Press. A. J. Frapiè, Paris, department of the Seine, 19 May, for five years.

Mechanical Window Blinds. F. Frentz, Metz, department of Moselle, 21 May, for ten years.

A pattern Machine to cut Coats. Cadet Gaches, Paris, department of the Seine, 17 June, for five years.

A Hydraulique Machine to Elevate Water. J. F. Gelhaye, Paris, department of the Seine, 6 August, for fifteen years.

A new excentric Water Wheel for Steam Boats. C. F. Gelinsky, Angers, department of Maine and Loire, 10 June, for ten years.

A new Water Frame for Spinning. C. A. Gelinsky, Paris, department of the Seine, 31 March, for fifteen years.

Improvements on "Girard" Flax Machinery. F. T. Gibert, Paris, department of the Seine, 25 November, for ten years.

Twilled Stuff of Horse Hair, Thread, &c. G. Godard, Paris, department of the Seine, 9 December, for five years.

An economical Plaster Kiln. A. Gournay d'Arnouville, and A. Jourdan, Paris, department of the Seine, 10 November, for ten years.

A Mechanism for Steam-boats. J. N. Granier, Creffom, department of Ain, 1 December, for ten years.

A Process to apply to Digging of Canals. J. J. Grasset-Tamagnon, Tarascon, department of B. du Rhône, 28 October, for five years.

An Improved Engine, (Steam). S. Hall, Paris, department of the Seine, 9 December, for fifteen years.

A Machine to Draw Silk, &c. C. Hallam, Paris, department of the Seine, 19 July, for fifteen years.

A Hydraulic Press, with double effect. L. A. Hallette, Arras, department of Pas de Calais, 15 May, for fifteen years.

An Apparatus to compress Gas. J. M. Hanchetts, Paris, department of the Seine, 1 July, for fifteen years.

An Horizontal Steam Engine. Leméme, Paris, department of the Seine, 23 September, for fifteen years.

An Apparatus to extract Gas from Oil, &c. Lemême, Paris, department of the Seine, 20 November, for fifteen years.

A process to make Carriages without the Axle-tree crossing the body. Leméme, H. G. Smith, and D. Gordon, Paris, department of the Seine, 10 Novembre, for fifteen years.

A Calico Printing Machine. G. Hertrit, Paris, department of the Seine, 30 December, for five years.

Method to drive or move Vessels with Gas. J. B. Hubert, Rochefort, department of Chareuse-infre., 10 June, for fifteen years.

New Washing Boat. J. Houvelin de Bavilliers, Premery, department of Niévre, 30 September, for ten years.

Cast-iron Sky-light Framing. Jacquemart, fils, Paris, department of the Seine, 19 August, for five years.

Mechanism to carry Gas. J. B. Jalabert, Paris, department of the Seine, 9 September, for fifteen years.

An Apparatus to extract Salt from Brine. A. E. Jauge, Paris, department of the Seine, 1 July, for fifteen years.

Aromatic Mustard. L. Josse, Paris, department of the Seine, 1 December, for five years.

A new mechanism for Piano-fortes. Klepfer-Dufaut, Lyon, department of the Rhône, 31 January, for five years.

A Bobbin Frame. J. B. Laborde, Paris, department of the Seine, 23 December, for five years.

Process to manufacture Paper with Hemp Stalks. J. Laforêt, Paris, department of the Seine, 10 June, for ten years.

A Blacking Wax for Cartouch Boxes. T. H. Laforge, Montpellier, department of the Hérault, 6 August, for five years.

A Machine to employ the Heat lost in Chimneys. J. B. Laignel, Paris, department of the Seine, 12 February, for five years.

Process to give all sorts of Metal Silver Colours. Lalouet-Puissan, Paris, department of the Seine, 30 December, for five years.

Weaving Combs, with loose teeth. Laverrière, fils aîné, U. Gentelet, Lyon, department of the Rhône, 2 September, for ten years.

Chemical process to Cotonise wooden Substances. B. Lebouyer des Gervais, A. F. Selligue, Paris, department of the Seine, 9 September, for ten years.

Manufacturing of Glass Pearls. Mademoiselle Lemaire, Paris, department of the Seine, 8 April, for five years.

Blowing Machine. Le Petit Lamasure, fils, Rouen, department of the Seine infre, 30 December, for five years.

Clothing Machine with two or three operations at once. Leroy-Barré, Sedan, department of the Ardennes, 1 July, for five years.

A Furniture for Umbrellas. A. Libbert, Paris, department of the Seine, 23 December, for five years.

A Machine to Sow Clover. Lunnel-Gennes, Aubray, aîné, Chaumout, department of Haut-Marne, 6th August, for five years.

Distilling all sorts of Tar. Luscombe, frerès, Le Hâvre, department of the Seine, infre, 9 December, for ten years.

Manufacturing of Glue. J. J. Maglagan, Dunkerque, department of Nord, 8 April, for ten years.

A Talking or Speaking Machine. Maelzel, Jean, Paris, department of the Seine, 31 January, for five years.

A new Power Loom. E. Magnan, Paris, department of the Seine, 19 November, for fifteen years.

New Fire Grate for Coals. David Martin, Lasalle, department of Gard, 19 February, for ten years.

Manufacturing of Hats with Feathers. P. Masnyac, Rougnac, department of Creuse, 12 August, for five years.

Manufacturing to weave Stuff with Glass Pearls. T. B. Mazel, Paris, department of the Seine, 22 April, for five years.

Improved construction of Mill Pivots. H. E. Michel, Châteauron, department of Judre, 10 November, for five years.

Process of Manufacturing a Sugar called "Azucalliros," N. Monibet, Paris, department of the Seine, 30 September, for ten years.

Spy Glasses for play houses. J. H. Monneret, Paris, department of the Seine, 11 March, for five years.

Flax and Hemp Spinning Machine. A. Montferrier, Paris, department of the Seine, 10 June, for fifteen years.

Manufacturing of Paper with a rotative continual motion. Montgolfier, Armonay, department of Ardèche, 12 February, for fifteen years.

A Windfan to clean Corn. J. B. Odier, père, St. Alban du Rhône, department of Isère, 19 April, for ten years.

A Bobbin Frame for Cotton Spining. La Compagnie d'Ourschamp, Paris, department of the Seine, 26 February, for ten years.

New Elastic Perriwigs. J. A. Pascal, Paris, department of the Seine, 8 July, for five years.

Metallic Cards. J. A. Pastor, fils aîné, Sédan, department of Ardennes, 10 June, for five years.

Carbonic Material for Sugar Refining. Payen et Pluviner, Paris, department of the Seine. Didier et Mussier, Clermont Ferraud, department of Puy-de-Dôme, 17 September, for five years.

New Hydraulick Machine to Raise Water. O. Pecqueur, Paris, department of the Seine, 19 February for ten years.

Method to Regulate Machines. Le Même, Paris, department of the Seine, 19 August, for fifteen years.

Saw Mill. F. Phillix, Marseille, department of B. du Rhône, 7 October, for five years.

A Press for all sorts of Manufactured Goods. Pluchart Braham et Ch. Ainsworth, St. Quintin Lille, department of Aisne Nou, 19 February, for five years.

Process of Manufacturing Flax-Satins. Poirier Tirouflet, Laval, department, of Mayenne, 8 April, for five years.

New Mechanism to adapt to Clocks. T. H. Pous, Saint Nicolas d'Aliermout, department of Seine, infre. 29 April, for five years

A new gun to Charge behind. Pottet Deleusse, Paris, department of the Seine, 9 September, for five years.

A Mode of Measuring the contents of Barrels. P. L. Pugnant, Belleville, près Paris, department of the Seine, 19 May, for five years.

An Atmospheric Machine, "Aérome." L. Puzarche et N. A. Jumel, Paris, department of the Seine, 9 April, for five years.

Process of Manufacturing Fire-arms for several charges. C. Ramel, Paris, department of the Seine, 17 June, for ten years.

A new Wine Press. Ch. Revillon, Mâcon, department of Saone et Loire, 26 August, for fifteen years.

A power Loom. Risler, frères, et Dixon, Cernay, department of Haut Rhin, 10 June, for five years.

A Machine to Sharpen the Flatts of Cards. Les Mêmes, Cernay, department of Haut Rhin, 27 September, for five years.

A Machine to Strip the same. Les Mêmes, Cernay, department of Haut Rhin, 10 November, for five years.

A Silk Wheel. D. Rodier, Nismes, department of Gard, 31 March, for ten years.

Machine to Dig Canals. Les Même, Nismes, department of Gard, 28 October, for fifteen years.

Process to Melt and Mix substances for Candles, &c. F. L. Roehn, Paris, department of the Seine, 12 February, for fifteen years.

Animal substances for Flowers. Rouyer, Jeane, Paris, department of the Seine, 31 January, for ten years.

Manufacturing of Biscuit Bread. A. Rubbini, Paris, department of the Seine, 18 March, for five years.

Manufacturing of Bricks. Isaac Sargeant et Ch. Hodgkin, Paris, department of the Seine, 6 August, fifteen years.

Machine to regulate Windmills. F. Sauvage, Boulogne-sur-mer, department of Pas de Calais, 31 January, for five years

Machine to Manufacture Wire. Scrive, frères. Lille, department of Nord, 20 Novembre, for five years.

Continual Typographic Press. A. F. Selligue, Paris, department of the Seine, 1 July, for ten years.

Process to Refine Silver. L. Serbat, Paris, department of the Seine, 21 October, for eight years.

Mechanical Typographic Press. J. Smith, Paris, department of the Seine, 6 August, for fifteen years.

Water Pump for Hydraulic pressure. J. Spiller, Paris, department of the Seine, 28 October, for fifteen years.

Perpetual Pencils. M. V. Susse, Paris, department of the Seine, 8 April, for five years.

Improvements in Rectifying Spirits E. Tachouzin, Eause, department of Gers, 17 December, for five years.

Silk Wheel. J. A. Tastevin, Alais, department of Gard, 21 Octobre, for ten years.

Machinery for Steam Boats. J. A. Tessier, Paris, department of the Seine, 10 November, for fifteen years.

Machine Looms. J. F. Thevenin, fils, Lyon, department of Rhône, 1 July, for fifteen years.

New Process to manufacture Tar. N. Toulouzan, Marseille, department of B. du Rhône, 19 August, for ten years.

New Apparatus for Steam Boats. A. T. Tourasse, Paris, department of the Seine, 29 April, for fifteen years.

New process of Tanning Leather. J. G. Tournal, Narbonne, department of Rude, 22 April, for fifteen years.

Process to Dye Hides or Skins. L. F. M. Trempé, La Villette près Paris, department of the Seine, 22 April, for five years.

Shoes to keep the feet warm. S. P. Tringuart Duclos Veuve, department of Loir et Cher, 2 September, for five years.

Crane applicable to Digging of Lands. Jesoph Vachier, Paris, department of the Seine, 31 January, for fifteen years.

To Manufacture Paper with Moss. Vanhoutem, Paris, department of the Seine, 30 June, for fifteen years.

New form of Shirts. Walker, Paris, department of the Seine, 30 December, for ten years.

New Moving or Propelling Power. Wattelar Wattrelot, Lille, department of Nord, 10 June, for five years.

Bandages for Ruptures. J. Wickham, Paris, department of Seine, 30 June, for five years.

Polytechnic and Scientific Intelligence.

Society of Arts.

DISTRIBUTION OF THEIR REWARDS.

[Continued from Page 388.]

Copies in Chalk, Pencil, or Indian Ink.

To Mr. D. Pasmore, 6, Salisbury-square, Fleet-street, for an historical drawing in pencil, the silver Isis medal. —To Mr. T. Percy, 42, Cleveland-street, Fitzroy-square, for a drawing in Indian ink of a landscape, the silver palette.—To Mr. Edgar G. Papworth, 10, Caroline-street, Bedford-square, for a drawing in pencil of animals, the siver Isis medal.—To Miss Alderson, 4, Bridge-row, Pimlico, for a drawing in chalk of a head, the silver palette.—To Miss Mary Eliza Friend, Clarke's Terrace, Cannon-street Road, for a drawing in pencil of animals, the silver palette —To Miss Liddle, 19, White-lion-street, Goodman's Fields, for a drawing in chalk of a head, the silver Isis medal.

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Lithography.

To Mr. J. Baker, Sydenham Common, for a drawing of a Gothic screen to a church, the large silver medal.—To Mr. G. Tytler, 10, Villiers-street, Strand, for a drawing of the interior of King's college chapel, Cambridge, the silver Isis medal.

Medal, Die, and Gem Engraving.

To Mr. W. Woodhouse, pupil to Mr. Halliday, Birmingham, for two medal dies, copies, the one a head, the other an entire figure, the silver Isis medal.—To Mr. T. Warner, 182, Terrace, Tottenham Court-road, for a head in intaglio, a copy, the large silver medal.—To Mr. Raphael

Clint, 5, Rolls Buildings, for an original intaglio of a head, the gold Isis medal.

To Mr. J. Wood, 20, Surrey-street, Strand, for an original design for the Society's vignette, the large silver medal. —To Miss A. Miller, Dorset-street, Dublin, for carvings in ivory of heads and figures, the gold Isis medal.—To Mr. W. Savage, 11, Cowley-street, Westminster, for block printing in colours, in imitation of drawings, the large silver medal and fifteen guineas.—To Mr. Henry Attenbury, student in surgery, 11, New Burlington-street, for an original coloured anatomical drawing, the silver Isis medal. —To Mr. J. R. Alcock, student in surgery, 11, New Burlington-street, for an original anatomical model, in coloured wax, the gold Isis medal.

The Thanks of the Society have been voted to the following Gentlemen, and their Communications have been directed to be inserted in the next Volume of the Society's Transactions.

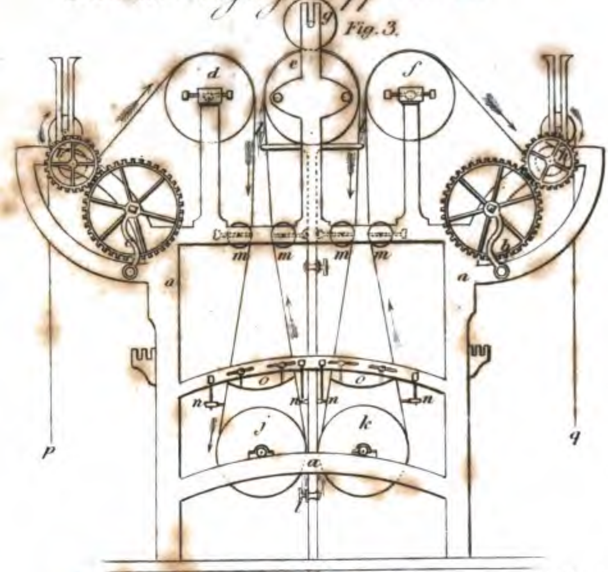
To Captain T. M. Bagnold, High-row, Knightsbridge, for his successful application of M. Appert's process to the preservation of lime-juice.—To the same gentleman, and to his brother, Captain M. E. Bagnold, of Bombay, for an account of the process employed at Bombay for making twisted gun barrels and sword blades, in imitation of those made at Damascus.—To Mr. C. A. Deane, Charles-street, Deptford, for his improved key for house doors.—To Mr. James Clement, Prospect-place, Newington Butts, for his stand for drawing boards of large area.—To Mr. C. Varley, Thornhaugh-street, for his mode of copying screws.—To Mr. Turrell, Clarendon-square, for his improved etching ground for engravers.—To M. Moreau, Soho-square, for his tabular view of British commerce.—To Mr. J. H. Abraham, Sheffield, for his magnet for extracting particles of iron and steel from the eyes of workers in that metal.

INDEX.

[N.B. By a mistake of the printer the page following 112, is numbered 169.]

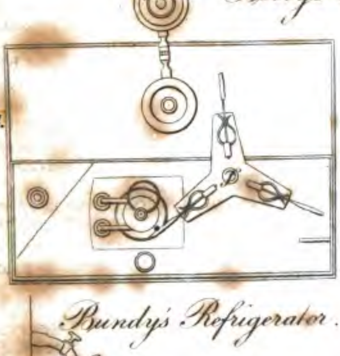
LONDON:
SHACKELL AND ARROWSMITH, JOHNSON'S-COURT, FLEET-STREET.

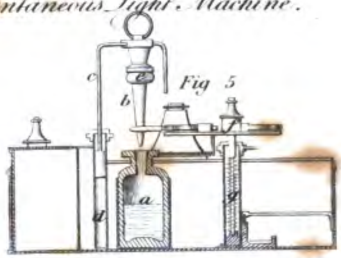
VOL. IX. Burn's Singing Apparatus. PL. 1.

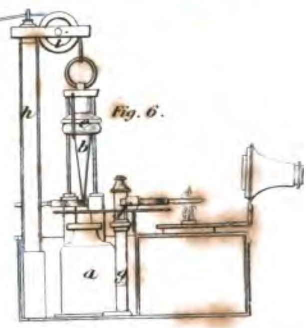


Berry's Instantaneous Light Machine.

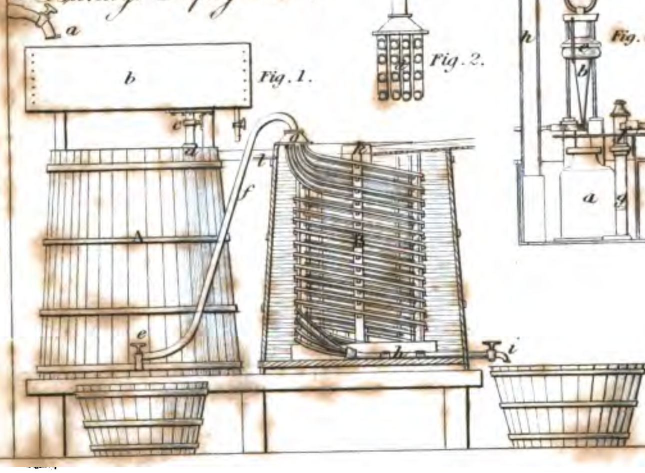
Fig. 4.





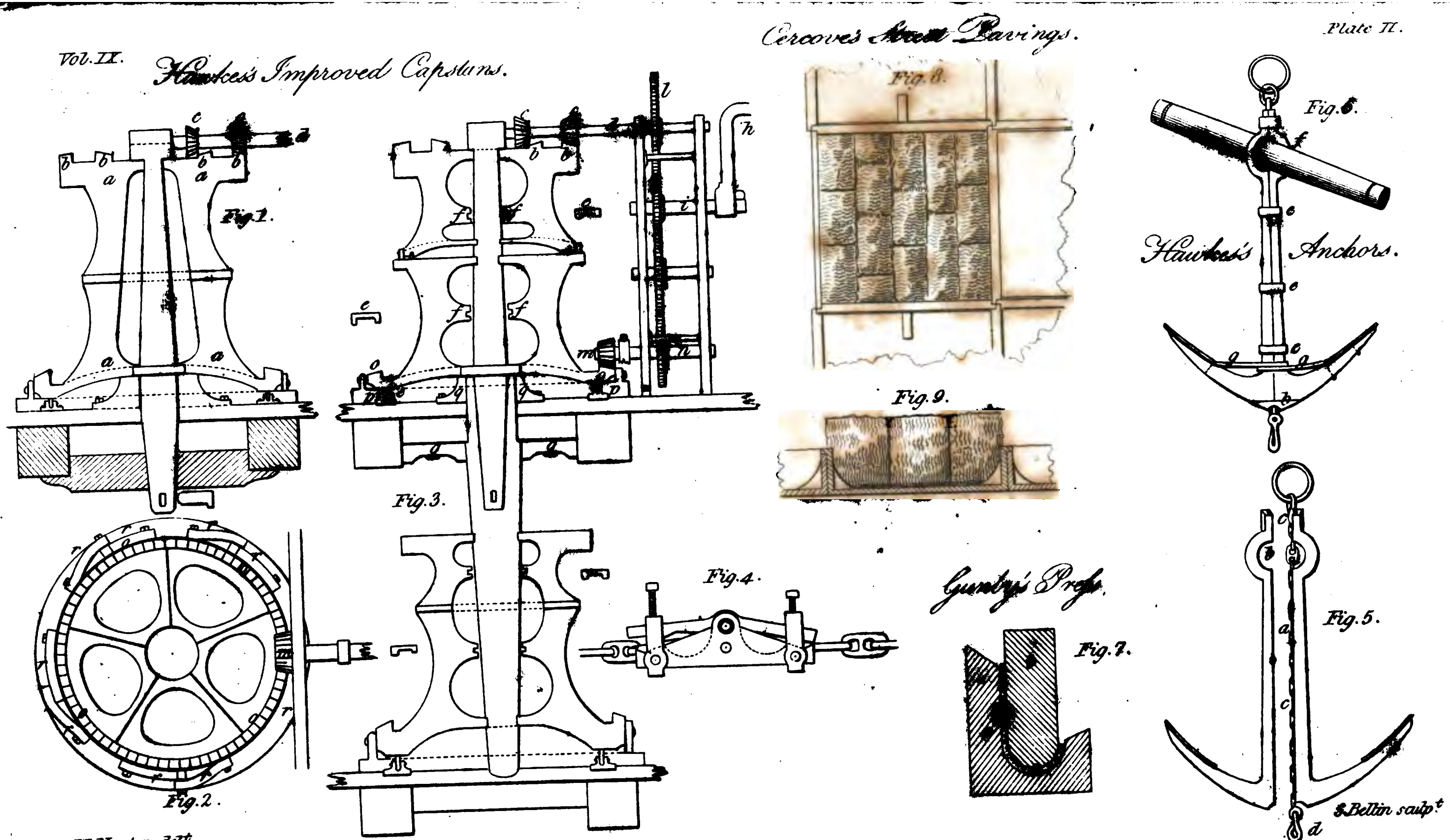


Bundy's Refrigerator.



W. Newton del.t

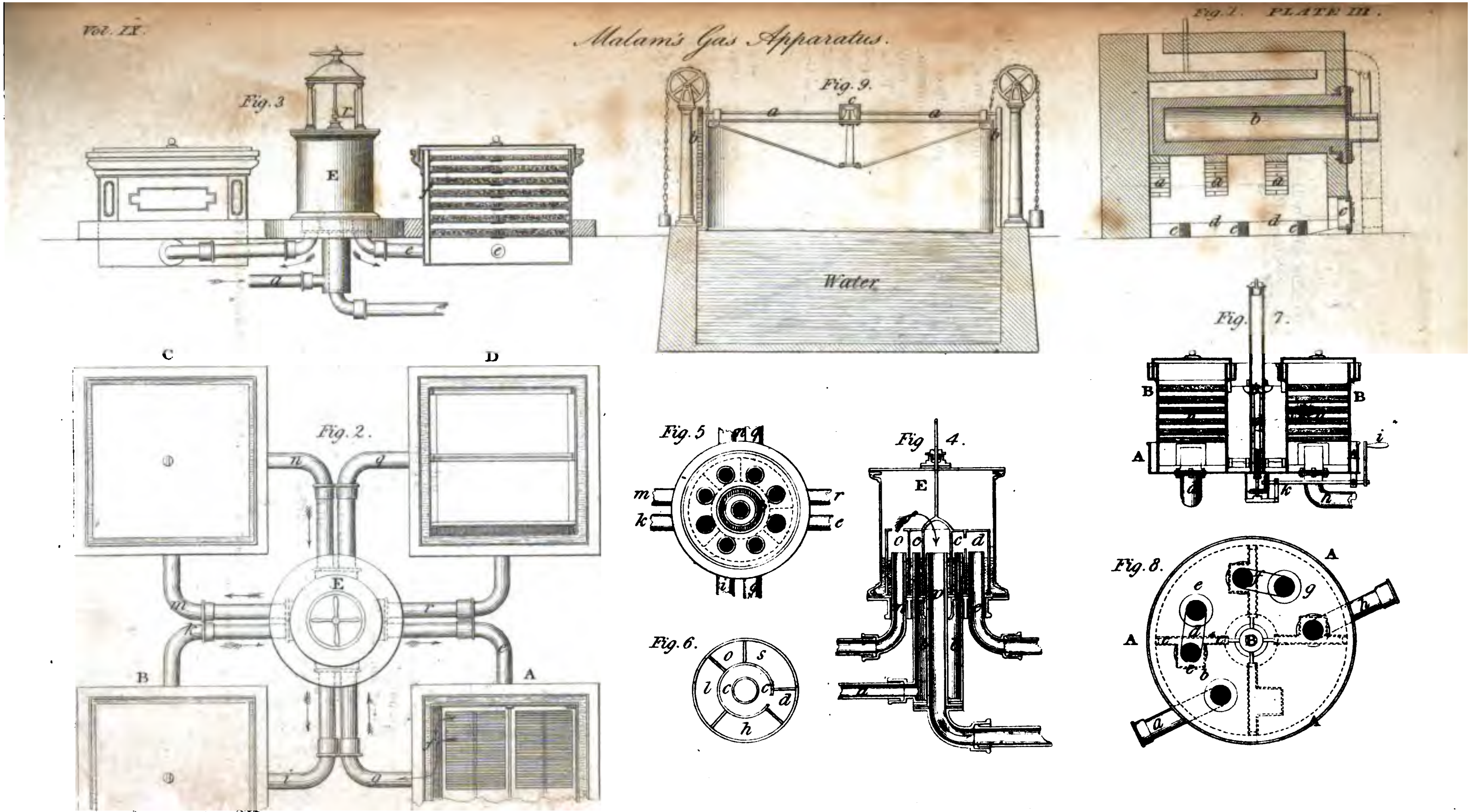
Vol. IX. Plate II.



W. Newton delt. S. Bellin sculpt.

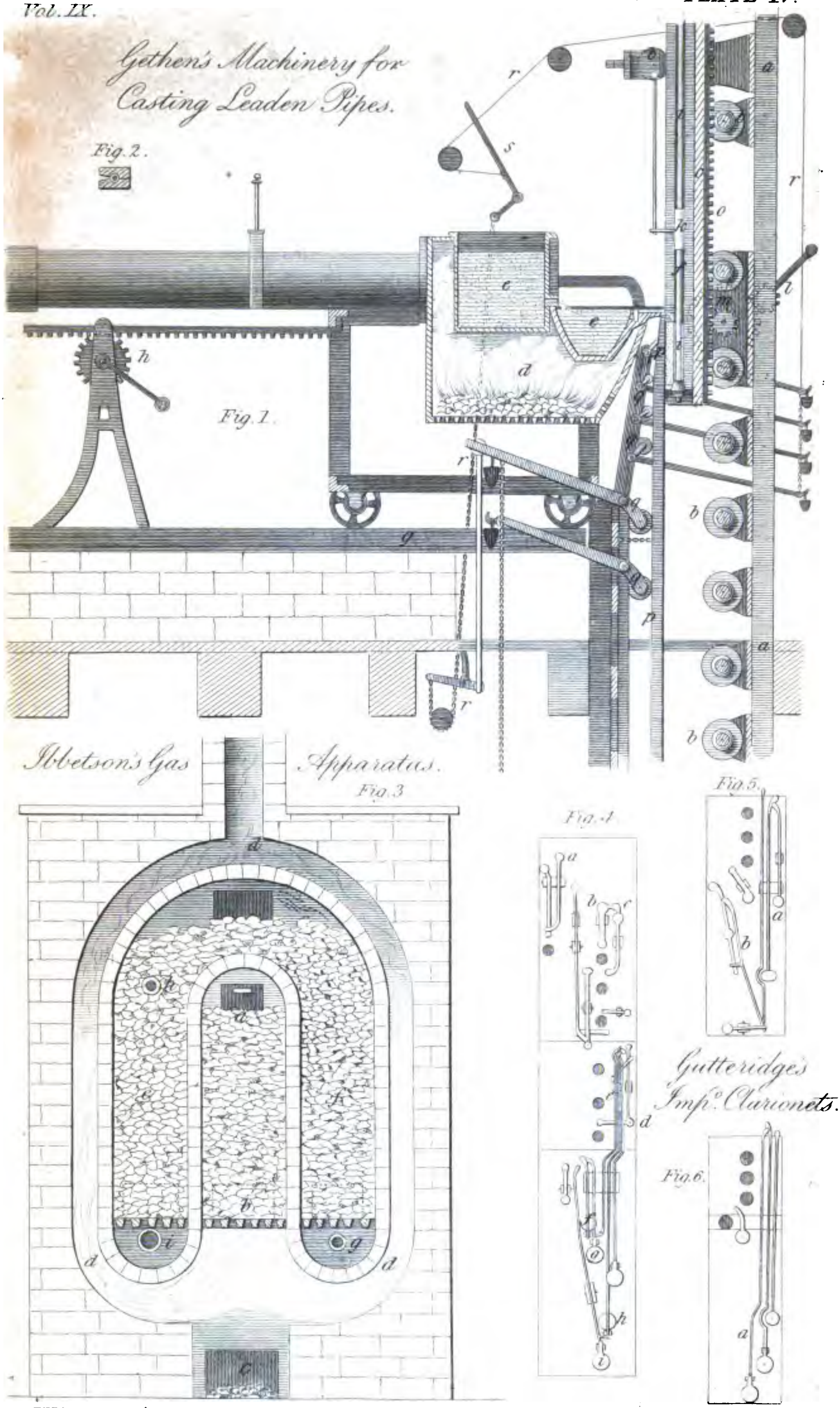
Malam's Gas Apparatus.

PLATE III.



W. Newton delt.

G. Gladwin sculpt.



W. Newton delt. S. Bellin sculpt.

Copeland's Apparatus for Gaining Power.

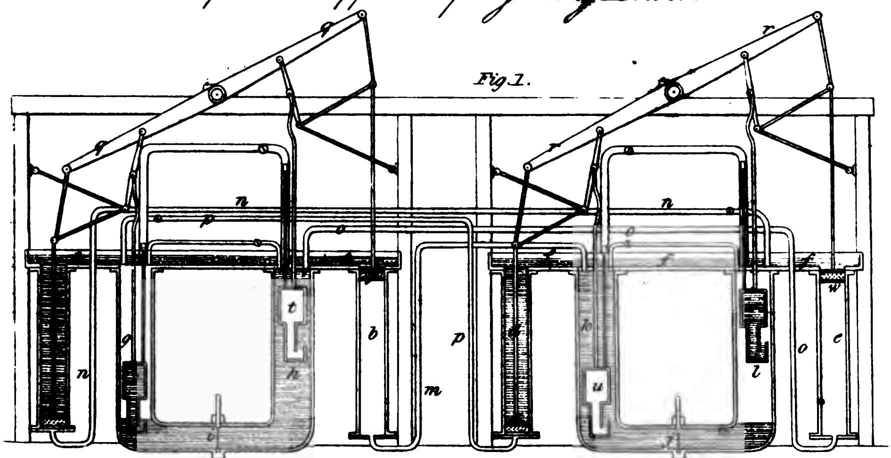


Fig. 1.

Cleland's Apparatus for evaporating Sugar.

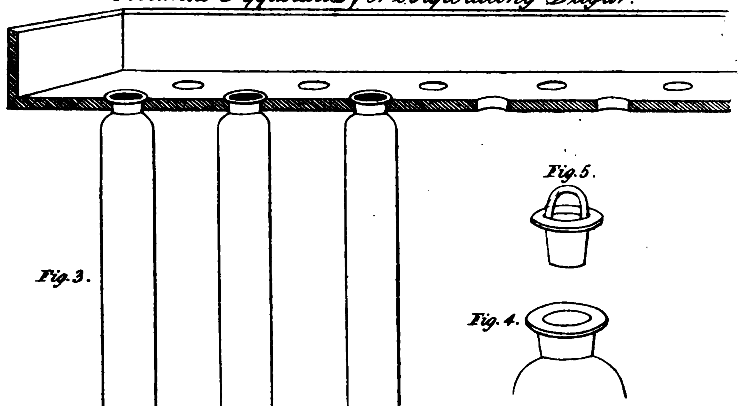


Fig. 3. Fig. 4. Fig. 5.

Evans' Coffee Roasting Apparatus.

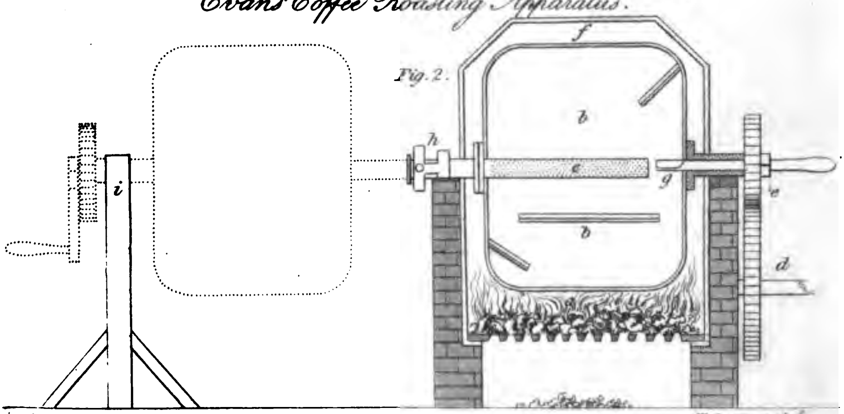
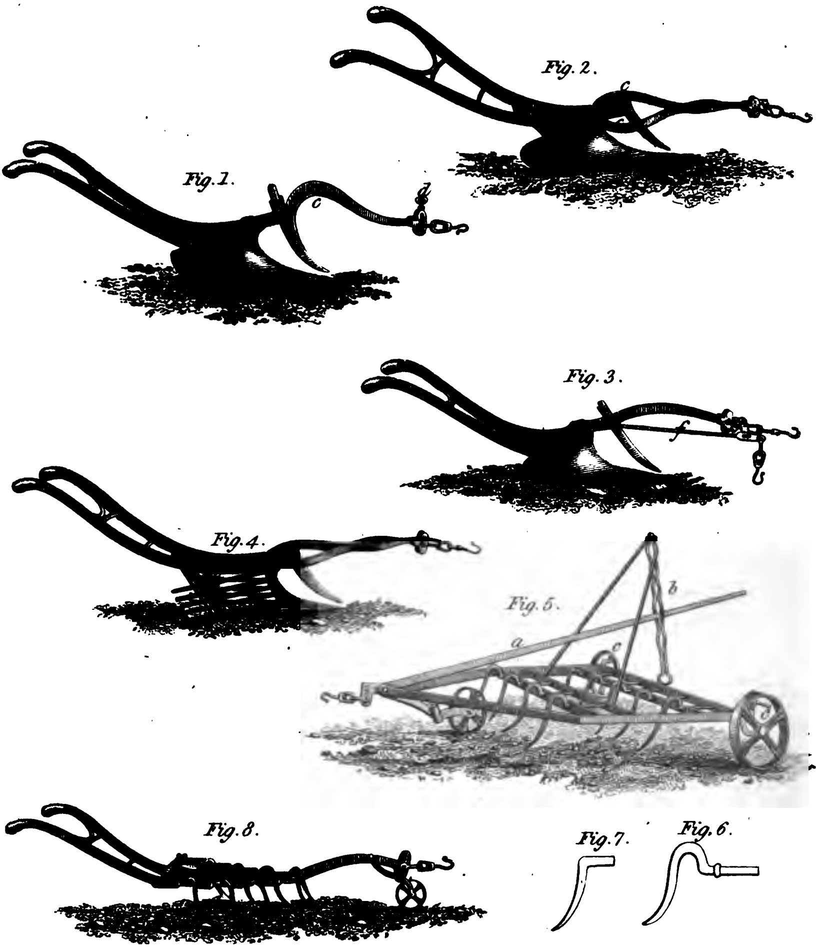


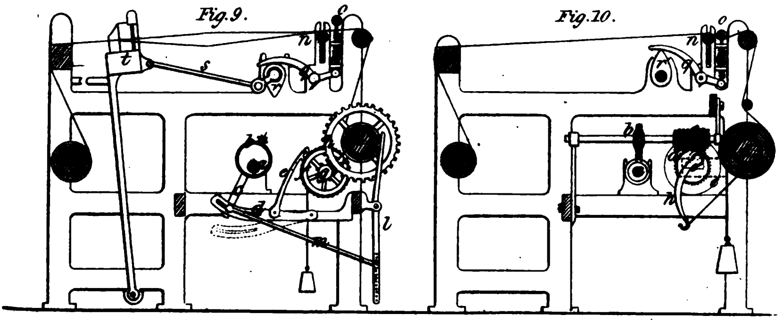
Fig. 2.

W. Newton del^t. T. Owen sculp^t.

Finlayson's Impd. Ploughs & Harrows.



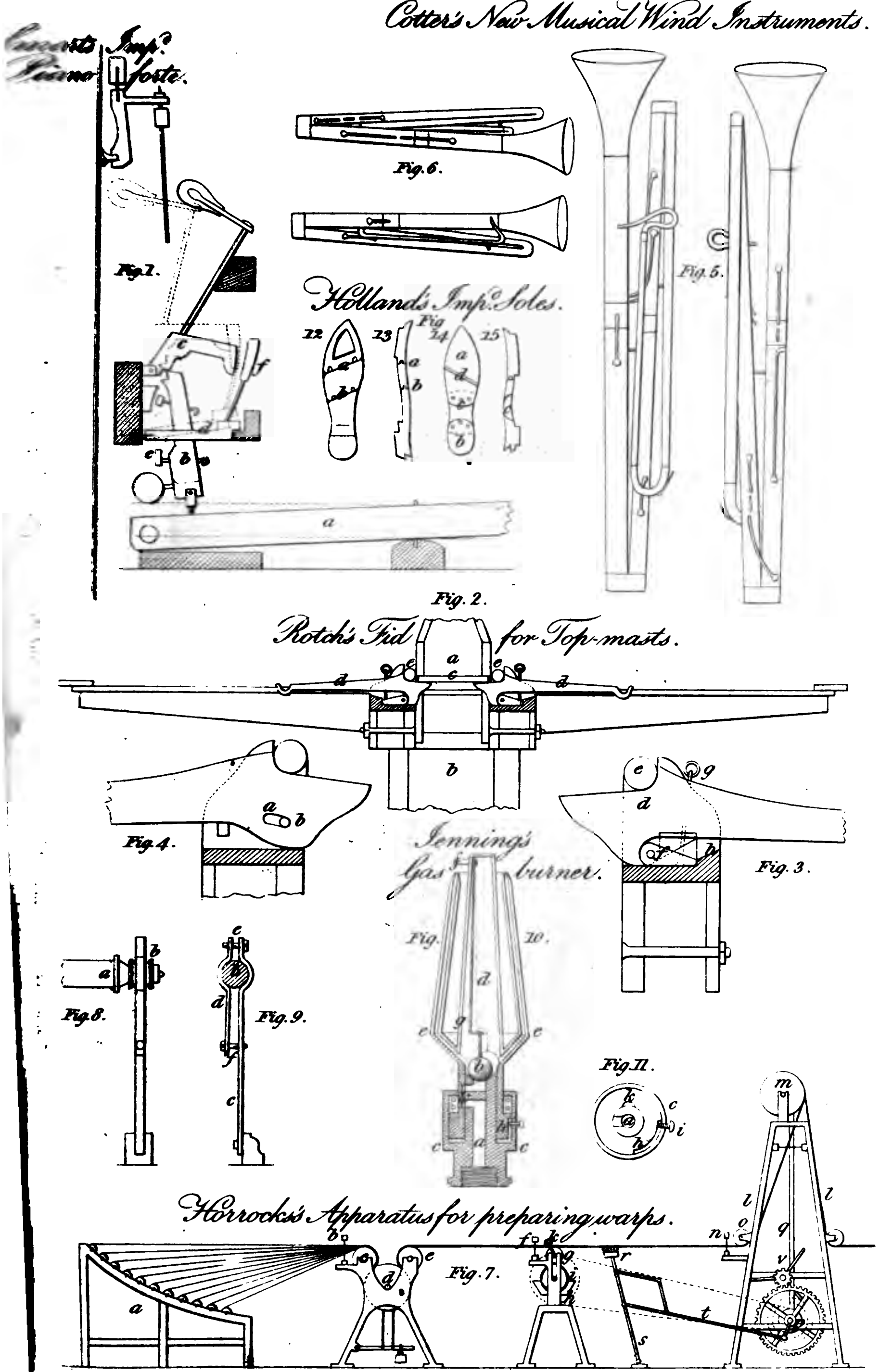
Stansfeld's Impd. Powerlooms.



1st March 1825.

W. Newton delt.

S. Bellin sculpt.



W. Newton del.t 1.st March 1825. G. Gladwin sculp.t

James's Improved Rail-roads.

Fig. 3.

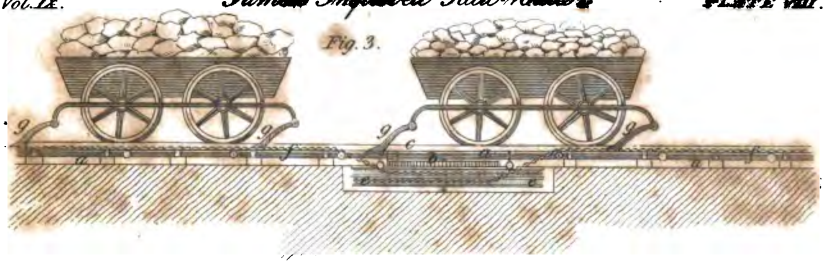


Fig. 2.

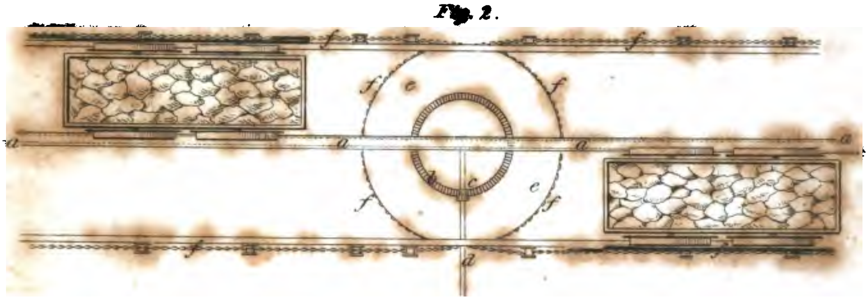


Fig. 5.

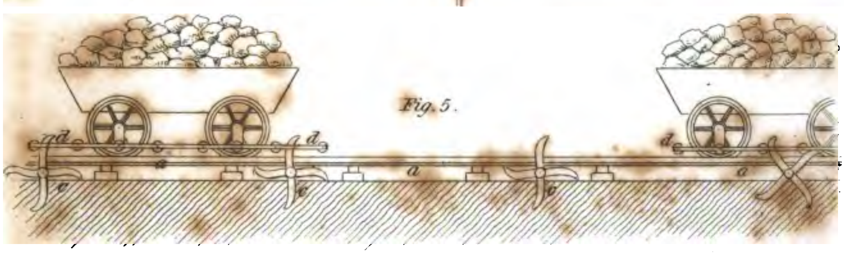


Fig. 4.

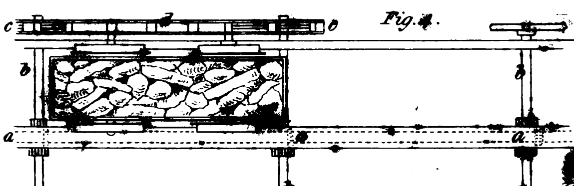
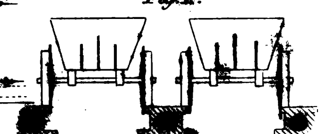


Fig. 1.



Finlayson's Improved Paving for Streets.

Fig. 6.

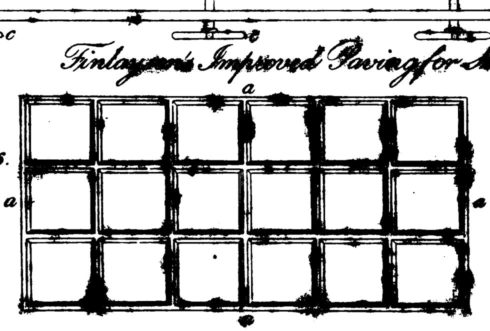
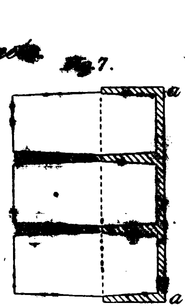
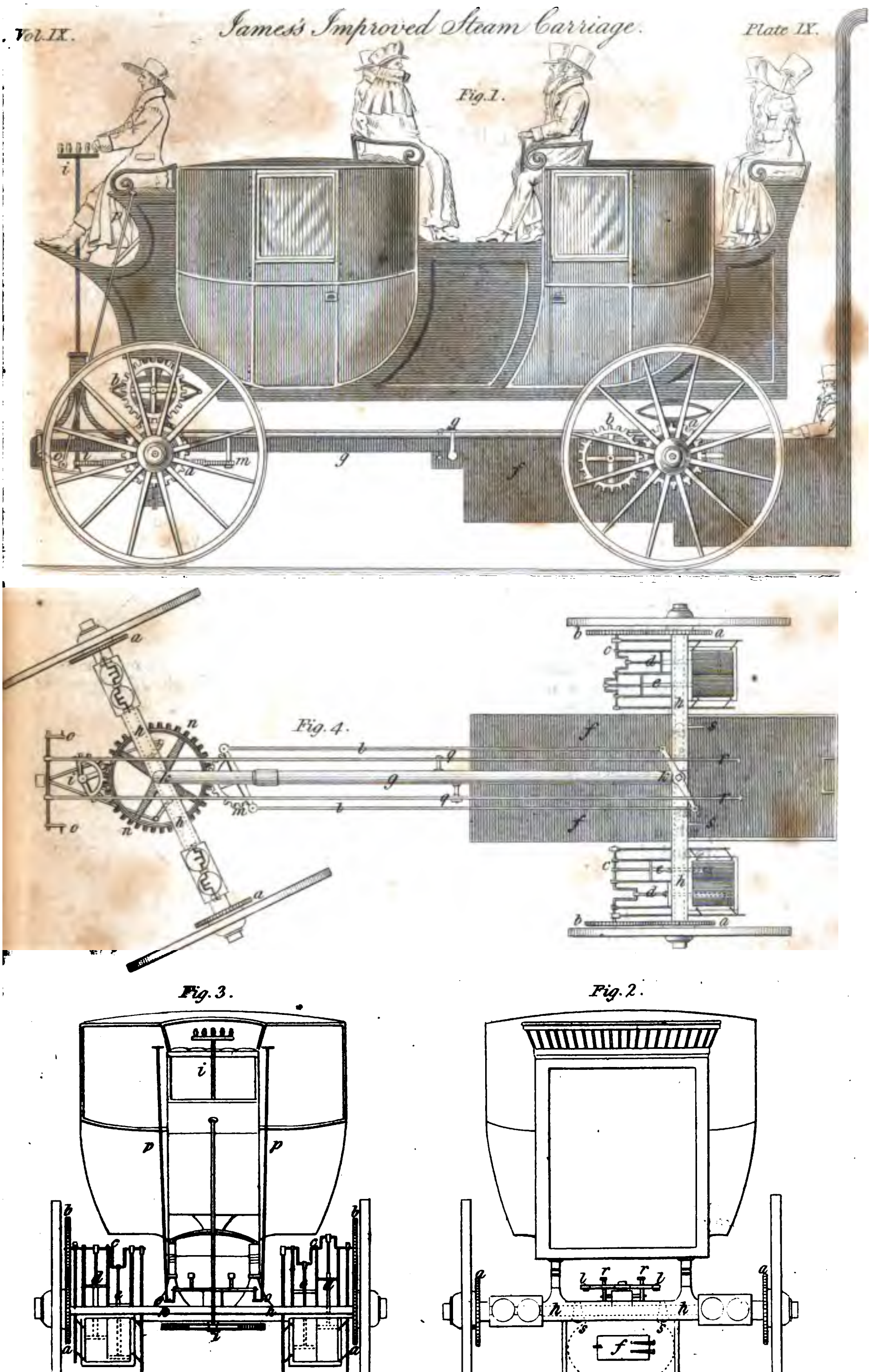


Fig. 7.



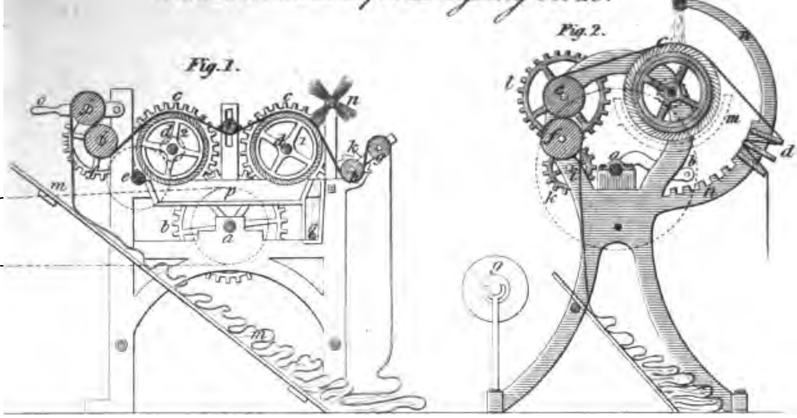
W. Newton del.t · 1st March 1825. S. Bellin sculp.t

Vol. IX. *James's Improved Steam Carriage.* Plate IX.

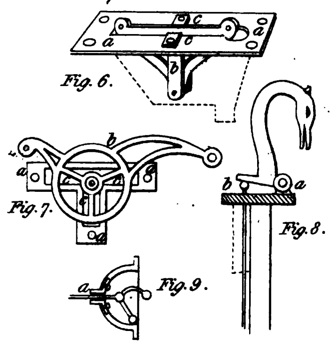


W. Newton delt. 1st April 1825. S. Bellin sculpt.

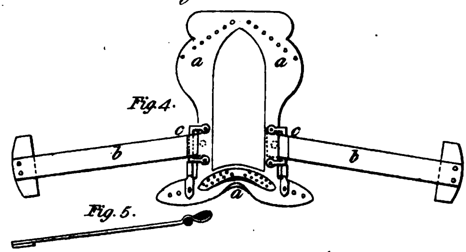
Jones's Machines for Dressing Cloth.



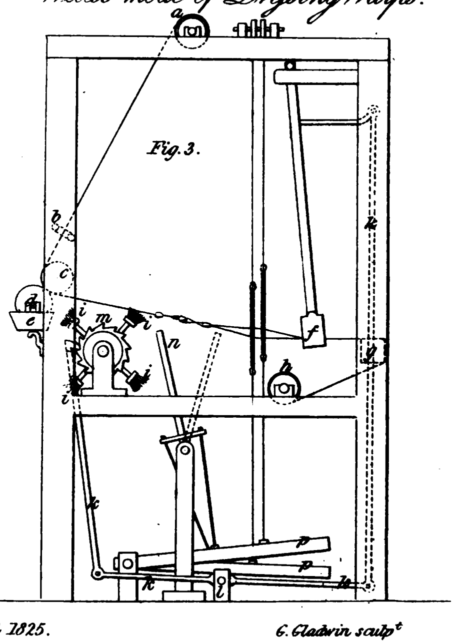
Burt's Impd. Bell Cranks.



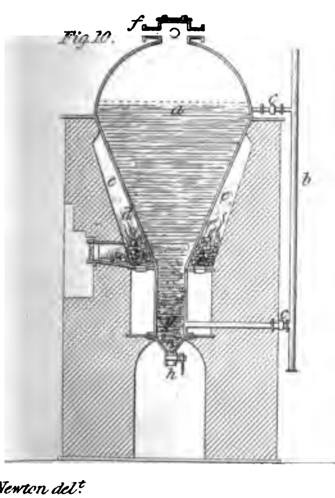
Jennings's Impd. Saddle.



Well's mode of Dressing Warps.



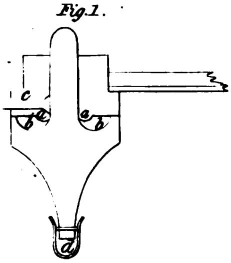
Parks's Salt Boiler.



W. Newton delt. 1st April 1825. G. Gladwin sculpt.

Richards's Skylight Frames.

Fig. 1.



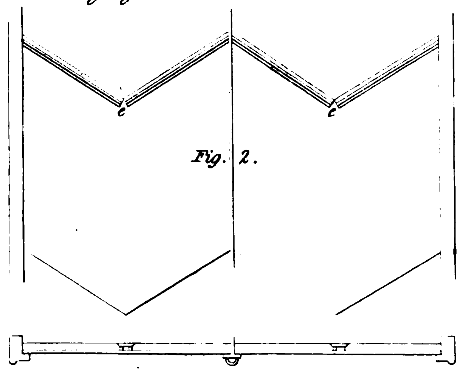
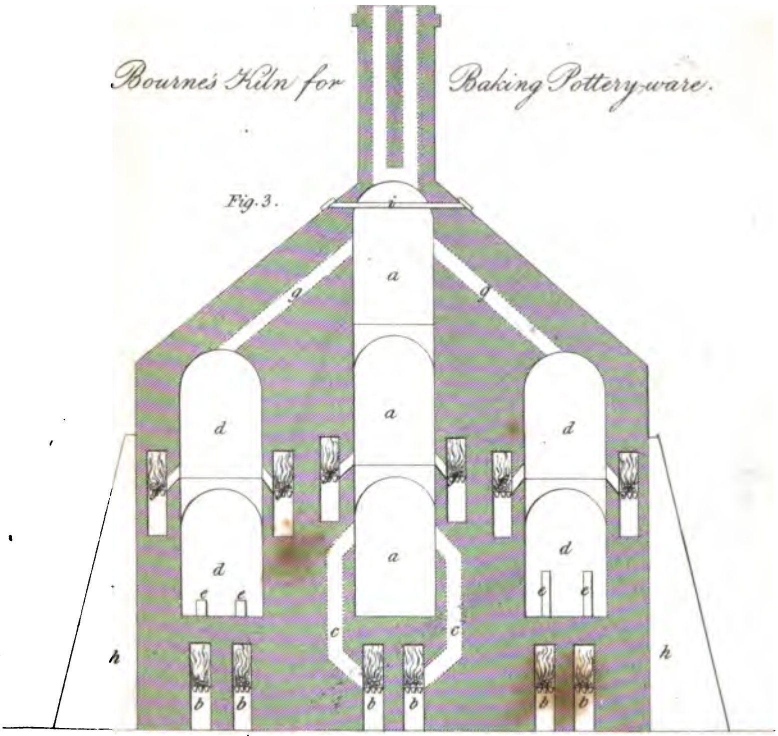


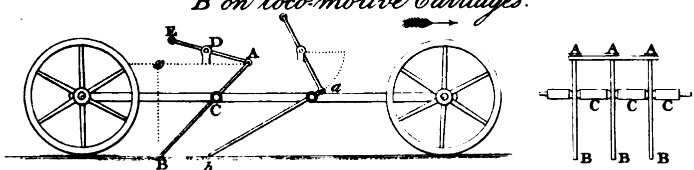
Fig. 2.

Bourne's Kiln for Baking Pottery-ware.

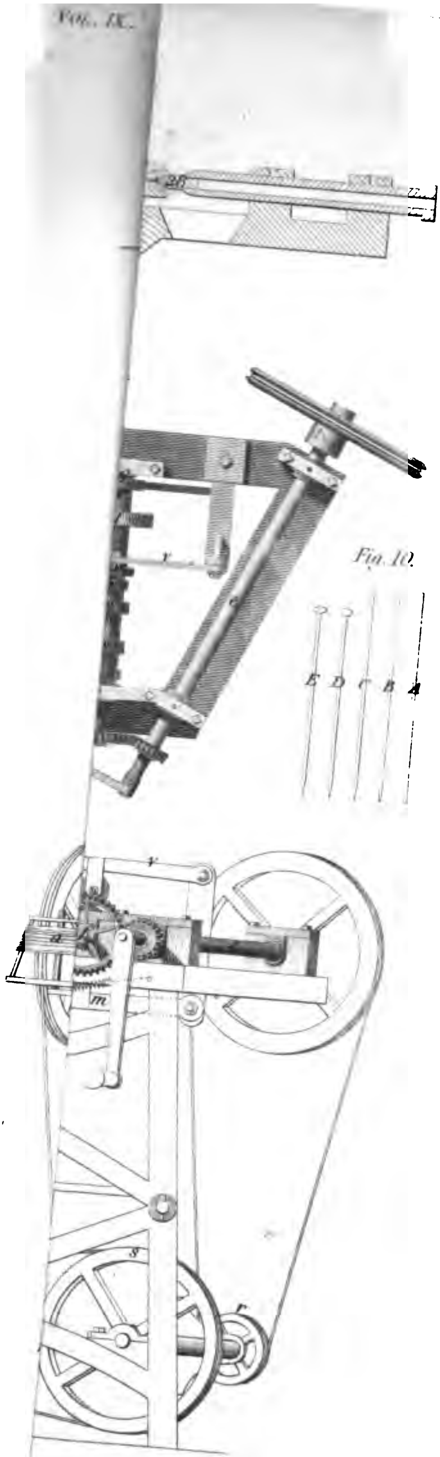
Fig. 3.



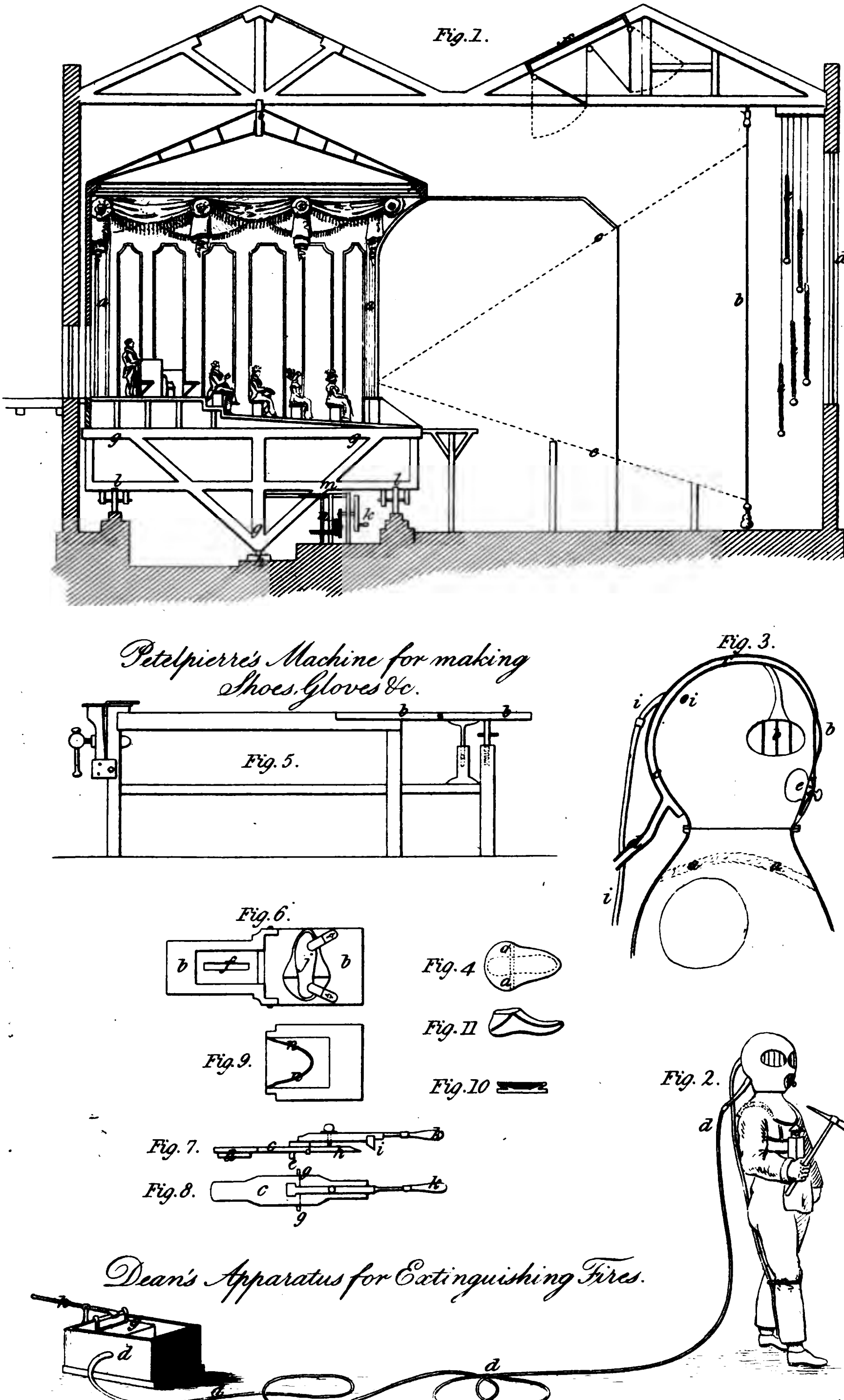
B on loco-motive Carriages.



W. Newton del.t 1st April 1825. T. Owen sculp.t



J. Newton delt.

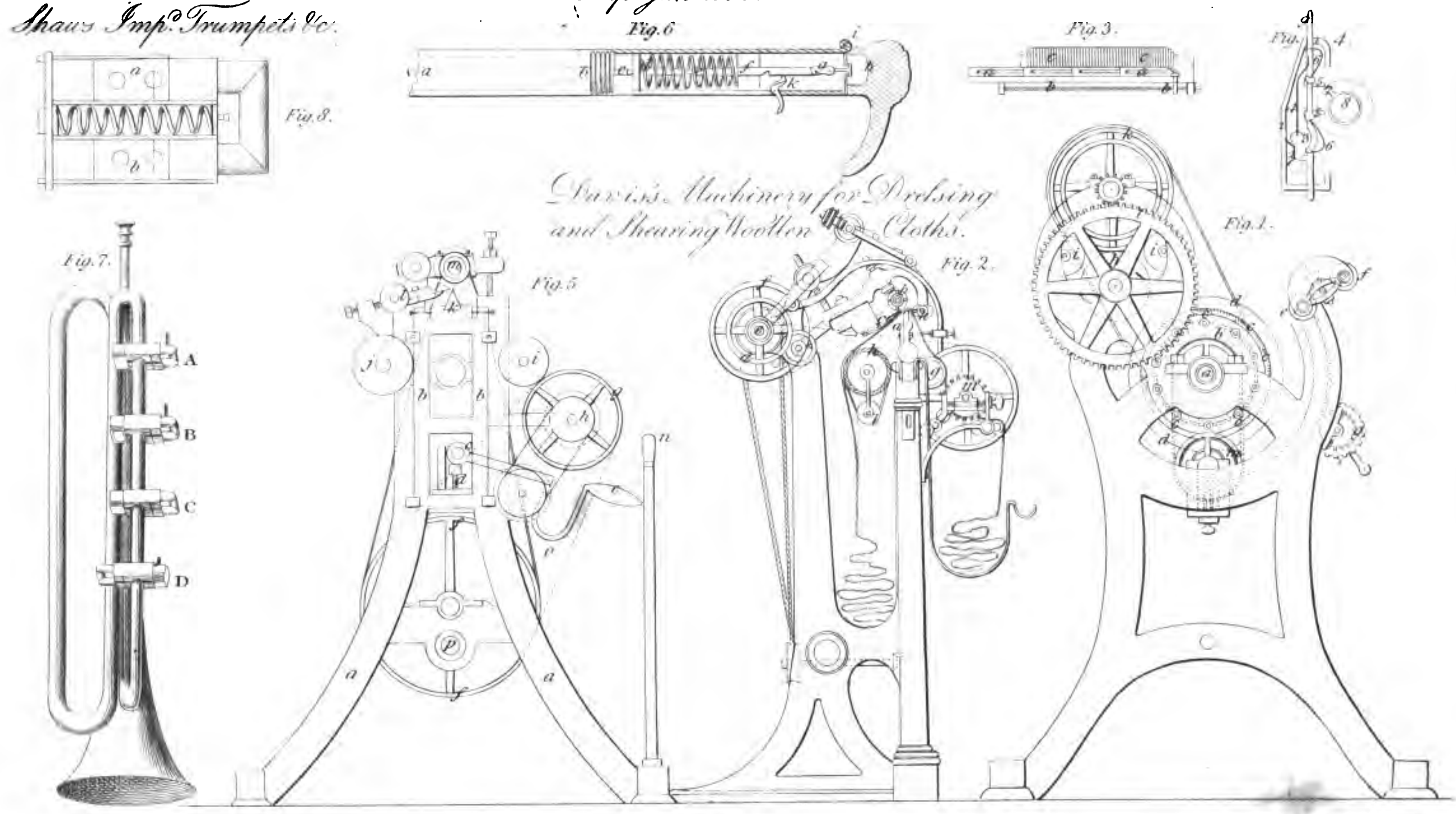


W. Newton delt. 1st June 1825. S. Bellin sculpt.

Vol. IX. PLATE XIV.

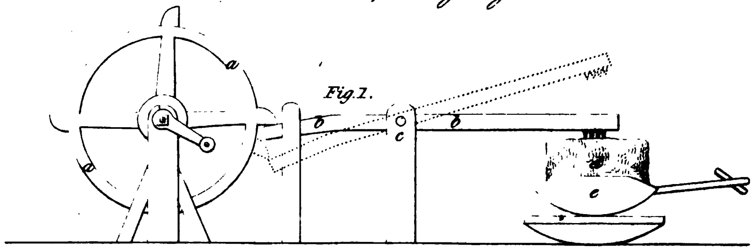
Shaw's Impd. Trumpets &c.

Cooks Impd. Gun-lock.



W. Newton delt.   1st May 1825.   S. Bellin sculpt.

Fig. 1.



Tonges Impd. Rigging.

Fig. 2.

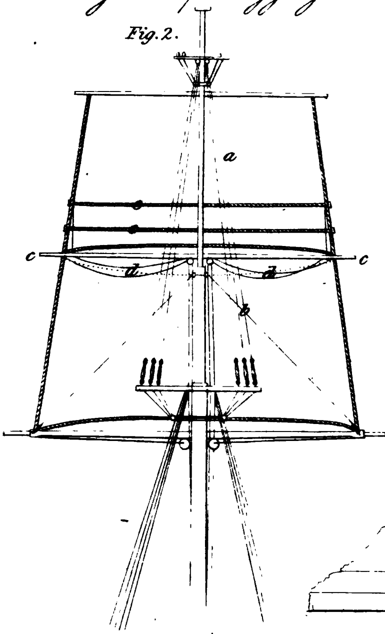


Fig. 3.

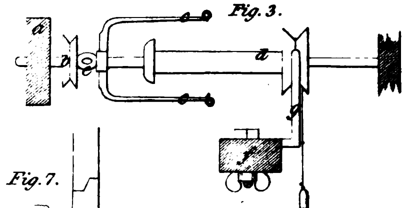


Fig. 7.

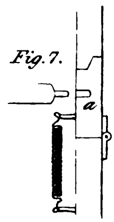


Fig. 4.

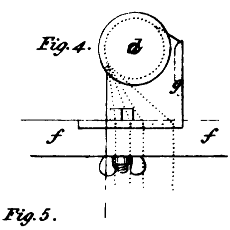
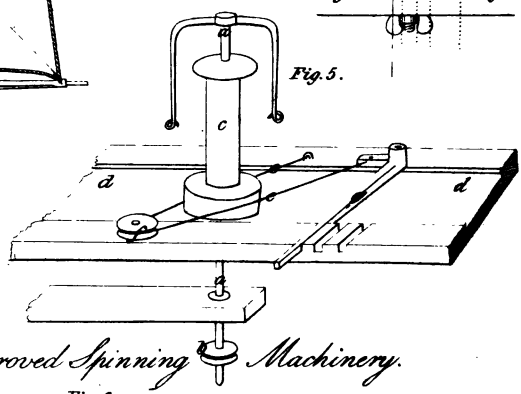
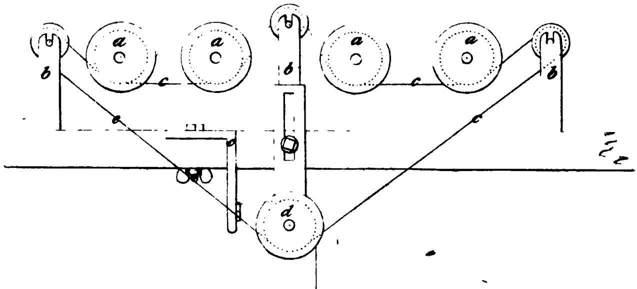


Fig. 5.



Leach's Improved Spinning & Machinery.

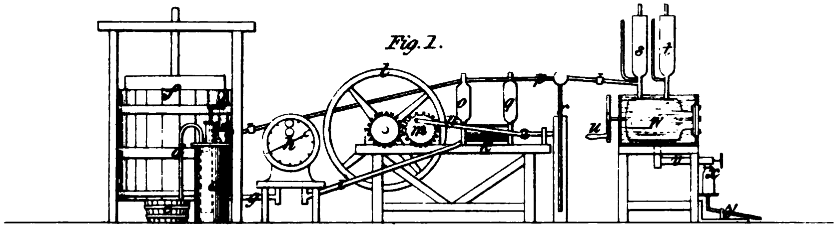
Fig. 6.



W. Newton del.t May 1.st 1825. T Owen sculp.t

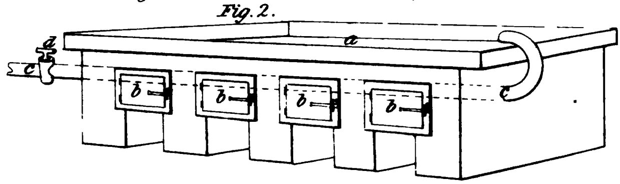
Swain's Apparatus for making Mineral Waters.

Fig. 1.



Jump & Court's Salt Pan.

Fig. 2.



Jordan's Impᵈ Water Closet

Fig. 3

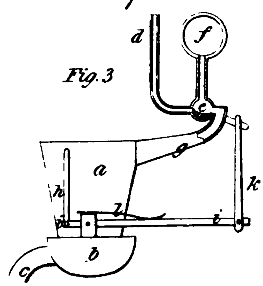
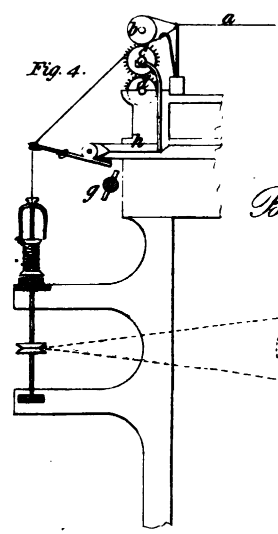
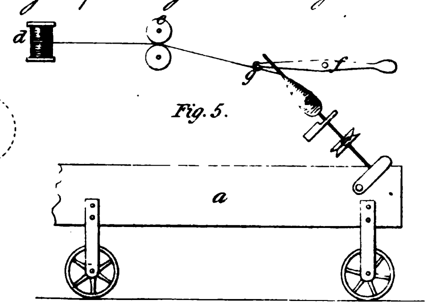


Fig. 4.



Bradbury's Spinning Machinery.

Fig. 5.



W. Newton delᵗ. 1ˢᵗ June 1825. G. Gladwin sculpᵗ.

Rogers's Instrument for measuring standing Timber.

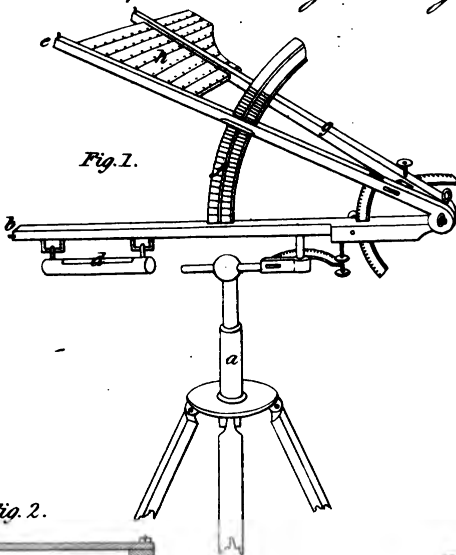


Fig. 1.

Fig. 2.

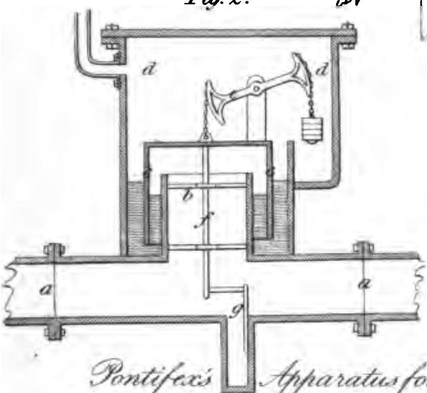
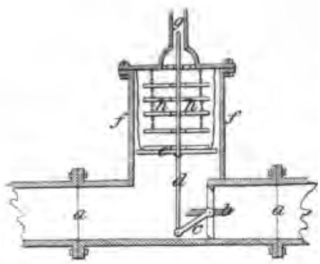


Fig. 3.



Pontifex's Apparatus for equalizeng the Pressure of fluids &c.

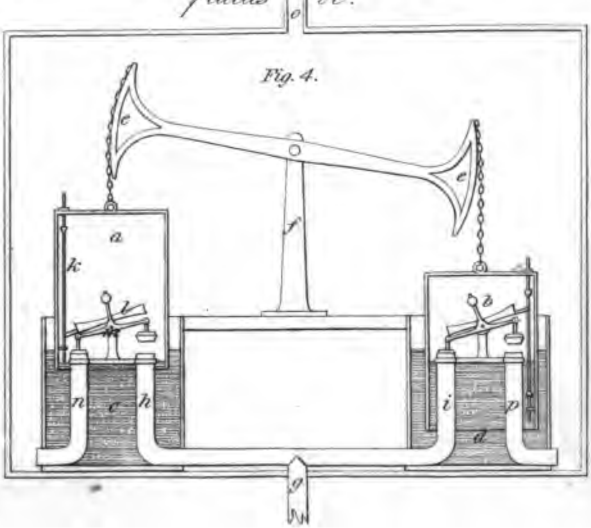
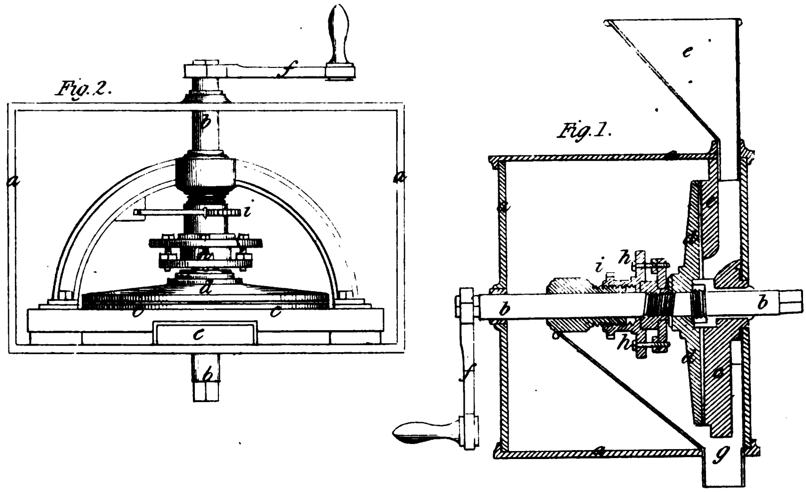


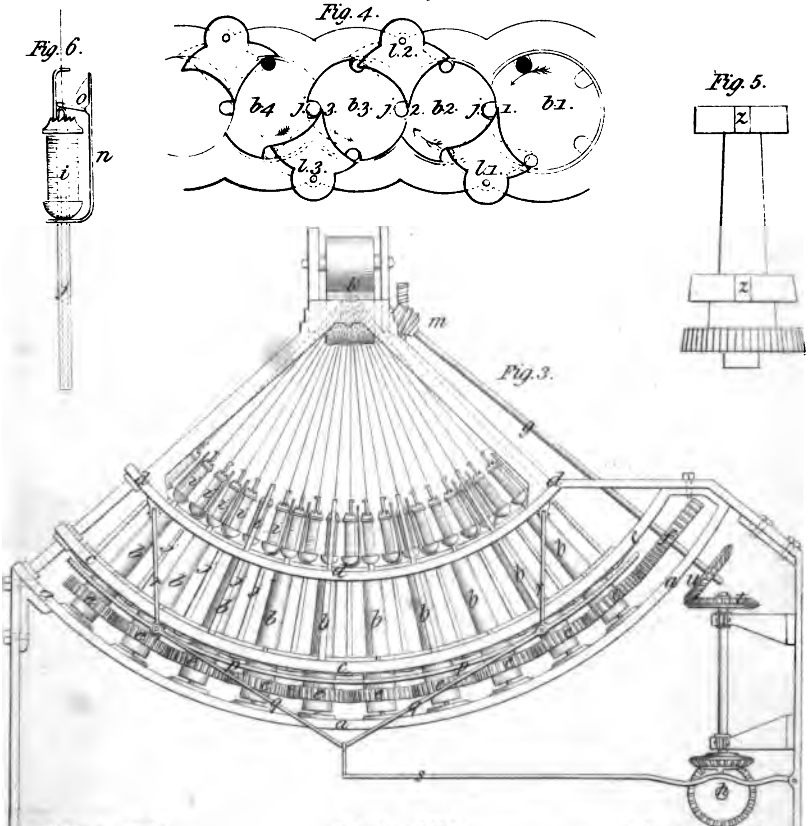
Fig. 4.

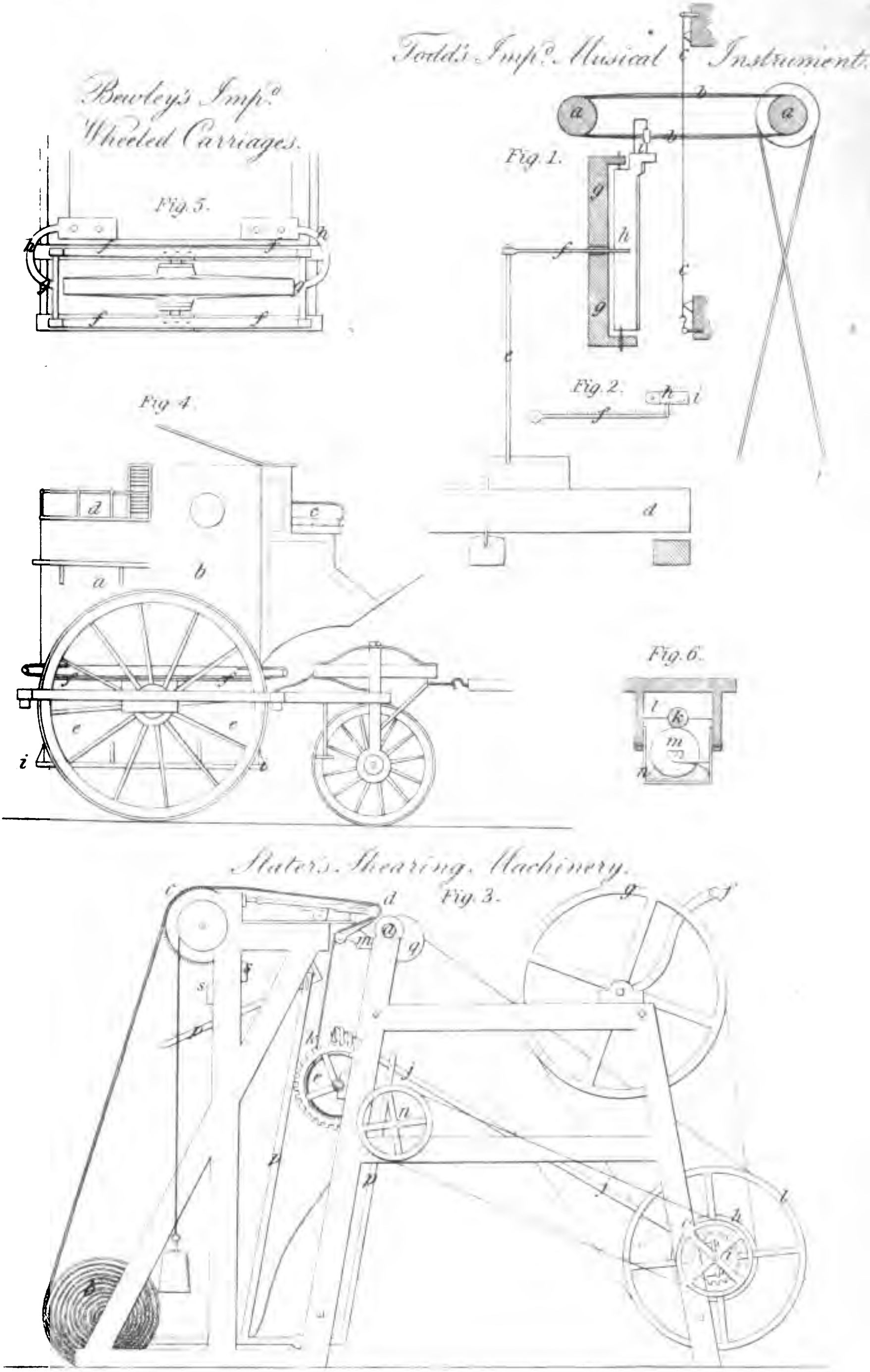
W. Newton del.t 1st June 1825. T. Owen sculp.t

Devereux Portable Corn Mill.



Heathcoat's Platting Machinery.





W. Newton delᵗ 15th June 1825. T. Owen sculpᵗ

Hobbins's Gas Apparatus.

Fig. 3. Fig. 1. Fig. 2.

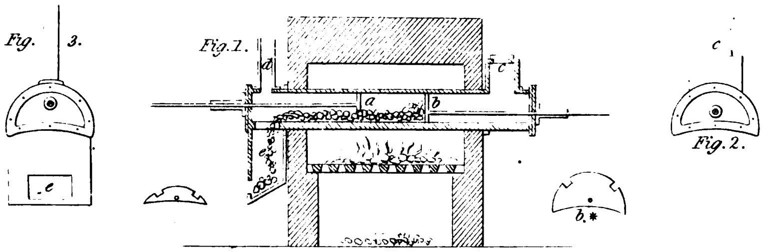


Fig. 4.

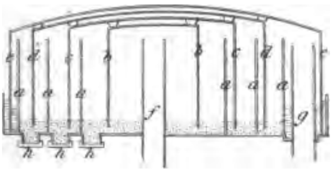
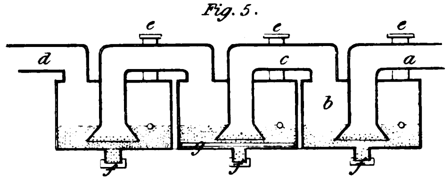
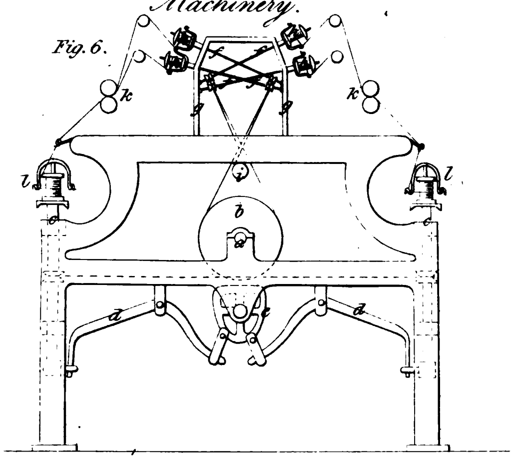


Fig. 5.



Gimson's Doubling & Twisting Machinery.

Fig. 6.



Chubb's Imp.d Lock

Fig. 9.

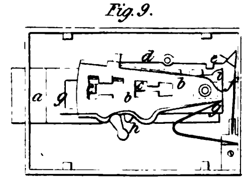
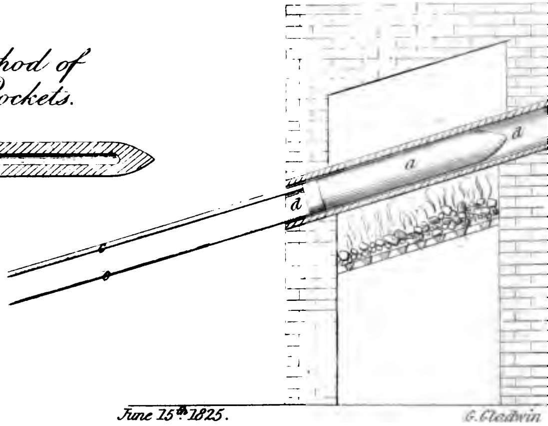


Fig 8



Perkins's method of Projecting Rockets.

Fig. 7.

W. Newton del.t June 15th 1825. G. Gladwin sculp.